DEPOSITIONAL SYSTEMS IN THE SPARTA FORMATION

(EOCENE) GULF COAST BASIN OF TEXAS

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DEPOSITIONAL SYSTEMS IN THE SPARTA FORMATION
(EOCENE) GULF COAST BASIN OF TEXAS

by

JOSE ULISES RICOY, Ingeniero Petrolero

THESIS

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PREFACE

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ABSTRACT

Three principal depositional systems were defined within the Sparta Formation of Texas using surface and subsurface data: high-constructive delta system in east Texas; strandplain-barrier bar system in central Texas; and high-destructive, wave-dominated delta system in south Texas.

Principal facies constituents of the high-constructive delta include upper delta plain in outcrop and lower delta plain, delta front, and prodelta in subsurface. Five major deltaic lobes in the Sparta Formation are similar to various lobes of the Eocene Queen City Formation, Lower Wilcox Group, Jackson Group, and Yegua Formation of Texas. The Sparta high constructive delta system is present from Fayette and Colorado counties in Texas, eastward into Louisiana, Mississippi, and Arkansas.

The Sparta strandplain-barrier bar system of central Texas is basically composed of a single multistory barrier bar unit. It was constructed with sand transported along strike by longshore currents from reworked sediments of the high-constructive delta system in east Texas. This

system extends from Fayette and Colorado counties westward to Atascosa and Live Oak counties. A Halocene analog is the Texas barrier island system. Eocene analogs are the strandplain-barrier bar system of the Eocene Jackson Group, Yegua Formation, Lower Wilcox Group, and Queen City Formation.

A high-destructive delta system in south Texas is composed essentially of coastal barriers and associated lagoonal facies in outcrop; and coastal barrier, lagoon, and prodelta shelf facies in the subsurface. This wave-dominated delta system is present from Atascosa and Live Oak counties southward to the Rio Grande, and it extends into northern Mexico. Eocene analogs occur in the south Texas Wilcox Group, Yegua Formation, and Queen City Formation.

Oil and gas have not been found in the Sparta Formation, in part because little growth faulting was associated with the thin Sparta delta front sandstone and prodelta shale facies. Water chemistry variations are closely related to depositional systems within the Sparta Formation. A bicarbonate province is related to updip areas (major fluvial influence) of the high-constructive delta system of east Texas; a sulfate province occurs in updip areas (barrier bar/lagoon influence) associated with the high destructive delta system of south Texas and central Texas; and a chloride province is associated with downdip marine sandstone facies of barrier and deltaic origin. Flushing by fresh water has quantitatively but not qualitatively altered the initial water distribution within the various Sparta sand facies.

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INTRODUCTION

This study involved the recognition and mapping of depositional systems and genetically related constituent facies in the Sparta Formation, Claiborne Group of Eocene age in the Texas Gulf Coast basin. The Sparta Formation is one of the many Tertiary, off-lapping, terrigeneous, clastic-wedge sequences that filled the Gulf Coast basin. It is composed of sand and mudstone deposits which are overlain by regionally persistent glauconitic, fossiliferous, marly shelf facies of the Cook Mountain Formation, and underlain by similar shelf facies of the Weches Formation.

Location

This investigation covers the outcrop and subsurface extent of the Sparta Formation in Texas, an area of approximately 30,000 square miles (fig. 1). It is bounded by the Rio Grande on the South (Mexican border), and by the Sabine River on the east (Louisiana border).

The Sparta Formation and associated stratigraphic units crop out from northern Mexico throughout Webb, Dimmit, Zavala, Frio, Atascosa, Wilson, Gonzales, Bastrop, Lee, Burleson, Robertson, Leon, Houston, Cherokee, Smith, Wood, Morris, Cass, Nacogdoches, San Augustine, and Sabine counties. The outcrop extends into the states of Louisiana, Arkansas, and Mississippi, where the Sparta is considerably thicker than in Texas.

Interval Studied

The interval studied in east Texas (fig. 2) is composed of facies that extend from the base of the progradational sandstone and mudstone facies of the overlying Yegua Formation to the base of the subjacent Weches Formation. It comprises the Cook Mountain, Sparta, and Weches formations in central-east Texas, and the Laredo Formation in southern Texas, which includes strata equivalent to the Cook Mountain and Sparta formations.

In east Texas, the Sparta Formation is approximately 400 feet thick in updip areas near the outcrop, increasing in thickness downdip to 650 feet where the sand facies disappear; regional dip is to the south at 100 feet per mile. In central Texas the Sparta varies in thickness from 200 feet updip to 350 feet downdip with a regional southward dip of 150 feet per mile. In south Texas, the Sparta varies in thickness from 300 feet updip to 500-750 feet downdip (thickening toward Mexico) with a regional dip southeastward toward the Gulf Coast at 150-250 feet per mile.

Terminology

Lithofacies within the Sparta Formation have been assigned to several depositional systems using terminology applied by Fisher and McGowen (1967) to the Eocene Wilcox Group of Texas. Depositional systems are assemblages of genetically related sedimentary facies. As such they are the stratigraphic equivalents of geomorphic or physiographic elements such as fluvial, delta, strand-plain, and barrier-bar systems.

Depositional systems are defined according to the nature and kind of associated component facies that are inferred to be genetically related. Composition, geometry, vertical sequence and pattern of facies, lateral facies distribution, facies association, and net sand pattern provide the principal basis for recognition of depositional systems.

Methods of Study

Data used in this study include outcrop information and subsurface control obtained primarily from more than 700 electrical well logs. The logs were correlated throughout the basin using twenty dip cross-sections and three strike cross-sections.

Net sandstone thickness for the Sparta Formation or equivalent strata was determined for each well log, and a net sandstone map was constructed which defines the principal sandstone dispersal pattern during Sparta deposition.

Sparta depositional systems can be easily differentiated in most of the area studied, especially in east and central Texas. The Sparta facies are difficult to delineate in some areas close to the outcrop in south Texas but net sandstone trends can be extrapolated updip from areas of better control in the deeper subsurface.

By integrating the cross-sections and the net sandstone patterns, a three-dimensional picture of sandstone and mudstone facies was delineated. Electric log character, net sandstone trends, and lateral and vertical stratigraphic relationships permitted the interpretation of facies that compose the depositional systems of this mid-Eocene interval.

Outcrop studies consisted of analyses of lithology, sedimentary structures, and lateral and vertical interrelationships exhibited by sandstone and shale facies. These data were integrated with the subsurface information to verify facies interpretation.

PREVIOUS INVESTIGATIONS AND STRATIGRAPHIC TERMINOLOGY

The Sparta sands of Louisiana were defined by T. W. Vaughan (1896) as deep quartz sands extending across Louisiana which were well developed near Sparta in Bienville Parish. He erroneously included Pleistocene sands in the formation. W. C. Spooner (1926) modified the original definition to include only Claiborne (Eocene) sands occuring near Sparta, Louisiana. Furthermore, Spooner divided the Claiborne Group into Yegua, St. Maurice, Sparta, and Cane River formations.

Dumble (1924) recognized four divisions of the Claiborne Group of east Texas: Yegua, Nacogdoches, Cook Mountain and Mount Selman. Dumble referred to the Nacogdoches as the transitional beds between the Cook Mountain Greensand and the gypsiferous clays of the Yegua. Later Wendlant and Knebel (1926) modified this definition of the Claiborne Group of east Texas. Based on outcrop and subsurface data, they subdivided the Cook Mountain into the Crockett and Sparta formations; and the Mount Selman into Weches, Queen City, Reklaw and Carrizo formations. Dumble's Nacogdoches was abandoned. They made these comments about the Weches, Sparta and Crockett (now Cook Mountain):

> Following the shallow conditions of the seas during Queen City time, the basin subsided again sufficiently to cause conditions favorable for glauconitic deposition. The Weches is a remarkable deposit of rather pure clayey glauconite whose average thickness is approximately 50 ft. throughout the basin proper. The Sands and light-colored clays, amounting to 250 or 300 ft. in thickness, between the Weches Greensand and the Crockett clays, are called the Sparta Sand, because they are equivalent to the same beds in Louisiana. The Sparta Sand was recognized by both Dumble (1919) and Kennedy (1922), who referred to it as Nacogdoches in age. However, the Nacogdoches, as defined, consisted of the transitional beds between Cook Mountain and Yegua. The Crockett Formation consists of chocolate brown and gray clay, ranging from 350 to 450 ft. in thickness and containing some beds of fossiliferous glauconite with concretionary zones of fossiliferous brown sandy limestone. The Crockett Formation also contains thin beds of sand, clay ironstone concretions, and in places is calcareous. The contact between the fossiliferous Crockett and the Yegua is transitional. The contact is normally selected where the last Crockett macrofossils disappear.

On the basis of micopaleontology and lithology (subsurface and surface), A. C. Ellisor (1929) supported the Wendlant and Knebel subdivisions of the Claiborne of East Texas and correlated the sequence with the Claiborne of Louisiana. She correlated the Crockett of Texas (now Cook Mountain) with St. Maurice of Louisiana, and the Sparta of Texas with the Louisiana Sparta. She noted the disappearance of the Queen City Formation toward Louisiana and the equivalence of Reklaw of Texas with Cane River of Louisiana. Renick and Stenzel (1931) extended the Claiborne subdivisions (Wendlant and Knebel, 1926) into the Brazos River area.

Sellards and others (1932) described the Weches as the marine, fossiliferous, glauconitic beds between the Queen City and Sparta sands. They inferred that the Weches Formation was deposited in moderately shallow, clear, marine waters, which deepened as the epoch advanced. The fossil molluscs *Vertagus wechesensis* Stenzel, *Turritella femina* Stenzel, *Rimella texana* Harris, *Latirus singleyi* Harris, and *Scutella mississipiensis* Twitchell were listed as index fossils of the Weches Formation.

Sediments of the Sparta Sand were mostly continental in origin according to Sellards and others (1932). They inferred that the basal sands were laid down on a beach and coastal plain in conjunction with the withdrawal of the Weches sea. The middle Sparta sands were interpreted to be mainly fluviatile deposits spread broadly over a flat terrain. The upper Sparta sediments were deposited along a transgressing shoreline laid down in advance of the Crockett sea. Thin laminae composed of the remains of land and marsh plants occur in the middle sands, but there are no significant layers of lignite. Clays are most prevalent in the upper part of the formation. They are gray or chocolate colored and contain considerable carbonaceous matter.

The Crockett Formation overlies the Sparta Sand and is overlain by non-marine beds of the Yegua Formation. The Crockett is constituted mostly of clay, shale, and sandy shale, which are fossiliferous and partially glauconitic; some limestone lentils occur within the formation. These strata are essentially of marine origin. Stenzel (1935) introduced Stone City Formation for transitional beds that separate the Crockett and the Sparta formations. Stone City was located at the San Antonio ferry on the Brazos River in Burleson County, Texas.

In South Texas, the Yegua, Cook Mountain, and Mount Selman Formations of the Claiborne Group were mapped by Deussen (1924) who correlated them with the east Texas outcrops. In the Rio Grande Valley, Trowbridge (1932) described the Cook Mountain Formation as "consisting chiefly of sand and sandstone. Most of the rock is medium grained. The beds are commonly glauconitic, ferruginous, and micaceous; many of them are cross-bedded and ripple marked. Interbedded with the sandstone are some white, yellowish, bluish, and greenish gray or chocolate colored clays and a few thin lenses of gray limestone. The sandstone and at some places the clay contain large dark-gray hard crystalline limestone concretions, some of which are fossiliferous. The lower two-thirds of the formation weathers into red sandy soil; the upper third at most places weathers gray." Trowbridge interpreted the depositional environments to be partially restricted bays and lagoons, but he inferred that the Cook Mountain is principally of open marine origin.

Kane and Gierhart (1935) traced the Claiborne Group into Mexico where they observed that the Cook Mountain Formation became thicker and is composed of a series of thick, massive, glauconitic sandstone deposits. Large fossiliferous concretions occur in many of the sandston beds. There are many fossiliferous limestone beds within the Cook Mountain Formation.

Gardner (1938) proposed the name Laredo Formation for the Cook Mountain in the Rio Grande embayment where the Middle Eocene section is different from equivalent strata in East Texas. Thick sandstone sequences in south Texas contrast with the thick clay deposits of east Texas.

From outcrop studies along the Rio Grande, Patterson (1942) showed that the Cook Mountain section consists of three units: thick sandstone members at top and bottom separated by a shale member. He concluded that the Cook Mountain, Yegua, and Fayette beds were apparently deposited under environments associated with transgressions and regressions. He inferred that both advance and retreat of shorelines began with mud deposition both basinward and shoreward from contemporaneous sandy deposits.

Eargle (1968) pointed out Gardner's (1938) proposition, and emphasized the use of Laredo Formation for those thick sand sections of the Cook Mountain Formation in south Texas.

DEPOSITIONAL SYSTEMS

General Statement

Fisher (1968) classified deltas into high-constructive systems, both elongate and lobate, characterized by a dominance of constructive deposits (fluvially influenced facies) over destructive deposits (marine influenced facies); and high-destructive systems, either wave-dominated or tide-dominated, that exhibit a predominance of marine-influenced (destructive) facies. The marine facies result from reworking or modification of fluvially introduced or influenced sediments.

The depositional processes that are dominant during the constructive phase of deltaic development are progradation of distributaries and areal extension of deltaic plains by crevasse splays. As distributaries become overextended, the river is diverted into a course having a steeper gradient and the cycle of distributary progradation (constructive phase) begins again. The abandonment of a distributary system initiates a destructive phase characterized by subsidence and reworking of deltaic deposits by marine processes. These destructive phases on a regional scale result in the deposition of marly, glauconitic, fossiliferous shelf muds that delimit upper and lower boundaries of a cycle of deltaic deposition. In this study, shelf facies include the lower part of the Cook Mountain and lower part of the Weches Formations that overlie and underlie the Sparta Formation respectively (fig. 2).

High-constructive delta systems are developed under conditions of high sediment input relative to marine reservoir energy. The resultant deposits show a progradational pattern normal to the depositional strike or relict coastline. The sediment source is generally far inland, and the fluvial feeder system is concentrated near the edge of the depositional basin.

The high-constructive elongate delta is characterized by thick mud deposits. Sand deposits composed primarily of distributary channel-fill and channel-mouth bar facies prograde over relatively thick prodelta mud sequences. These elongate sand bodies were called barfinger sands by Fisk (1961). Bifurcation of distributaries results in barfinger sands that in map view resemble a bird's foot. Prodelta muds grade upward into silty sands and well-sorted sands of the channel-mouth bar (barfinger) facies. If progradation continues, the channel-mouth bar facies will be overlain transitionally by silty sands and muds of levee origin, and organic-rich clays representing delta marsh plain deposits. When a distributary channel becomes overextended, it shifts suddenly to a new channel with a steeper gradient and the cylce of distributary progradation begins again. Although an abandoned delta lobe founders rapidly due to the large thickness of the underlying prodelta muds, it is exposed for a time to marine processes (destructive phase) which rework the sediments.

The high-constructive lobate delta type, as shown by several abandoned deltas of the Mississippi system (Frazier, 1967) are also developed under conditions of high sediment input but these delta front sands prograde over thin prodelta muds deposited in relatively shallow water. The constructive phase (progradation of distributaries) is similar to elongate deltas, but progradation is limited and channel abandonment is more common, resulting in many branching distributaries. Because available wave-energy significantly reworks the shallow delta-front sands, a lobate sand pattern is characteristic. During delta abandonment (destructive phase) foundering is not as rapid as in the elongate type, and the abandoned delta is intensively reworked by marine processes. The delta front sands are reworked to produce transient delta-fringe islands which progressively shift landward across the subsiding delta plain.

In high-destructive delta systems, sediment input is subordinate to marine wave and current energy, and accordingly, these systems are composed of fluvially introduced sediments that are contemporaneously reworked by marine processes. Thus, in wave-dominated deltas, the resultant deposits are formed mostly of destructive facies (marine influenced), and principal sediment accumulation occurs as a series of coastal barriers flanking the river mouth, giving a cuspate to arcuate trend to the sand bodies. Modern barrier bar and strandplain facies consist mostly of well sorted, locally glauconitic sands overlying fossiliferous, shallow-water prodelta shelf muds. Sediment is fed by fluvial systems that are commonly characterized by a high proportion of sand to mud (high bedload to discharge ratio). Streams form chiefly meandering fluvial systems; lateral shifting of streams and paucity of mud result in a poorly developed delta plain facies. Prodelta facies are thin, well burrowed, fossiliferous and glauconitic muds.

Sparta and Associated Depositional Systems

The Sparta Formation is a very well differentiated lithostratigraphic unit. In east Texas, it is underlain by the Weches Formation and overlain by the Cook Mountain Formation, both of which can be differentiated in outcrop, and in the subsurface (figs. 3-6) because of the marly character of these shelf facies. The marly basal facies of the Weches and Cook Mountain formations represent marine transgressions preceding and following the Sparta progradation, and can be recognized on dip and strike cross sections (figs. 3-7, 14, 15).

Sand distribution within the Sparta Formation (fig. 16) delineates two principal areas of sand input, east and south Texas. The Sparta Formation in east Texas (fig. 17) is a high-constructive lobate delta system, similar to the lower part of the Wilcox Group (Fisher and McGowen, 1967), Jackson Group (Fisher and others, 1970), Yegua Formation (Fisher, 1969), and Queen City Formation (Guevara, 1972), where sandstone maxima with a lobate tendency are oriented perpendicular to the depositional strike. The Lafourche and St. Bernard deltas of the Mississippi delta system (Frazier, 1967) are Holocene analogues of the high-constructive Sparta delta system.

The Sparta Formation in south Texas (fig. 17), is a high-destructive, wave-dominated delta system similar to the Uppper Wilcox Group and Yegua Formation (Fisher, 1969), and Queen City Formation (García, 1972), where sandstone maxima are similarly oriented parallel to the regional depositional strike. Other examples include the Holocene Rhone, Po, and Nile delta systems, as well as the Holocene Tabasco (Mexico), and Pleistocene Suriman coast (Fisher, 1969).

In central Texas the Sparta Formation was deposited in an interdeltaic area, which is characterized by a strandplain/barrier-bar system. This system was built parallel to depositional strike, fed by way of longshore currents from the eastern high-constructive delta system. The barrier islands along the Texas coast are modern examples.

The Sparta Formation is significantly thicker eastward in Louisiana, Mississippi, and Arkansas. Equivalent and also thicker sand deposits occur in northeastern Mexico.

High-Constructive Delta System, East Texas

Sandstone distribution map (fig. 16), cross sections (figs. 3 to 15), outcrop observations, and comparison with the Lower Wilcox Group (Fisher and McGowen, 1967), Jackson Group (Fisher and others, 1970), Yegua Formation (Fisher, 1960), and Queen City Formation (Guevara, 1972) provided the basis for defining the high-constructive Sparta delta system in east Texas. Eastward from Fayette and Washington counties into Louisiana, the Sparta Formation is characterized by a net sandstone maxima that is oriented perpendicular to the depositional strike, and exhibits a lobate areal geometry similar to the Lafourche and St. Bernard lobes of the Holocene Mississippi delta system (Frazier, 1967).

The facies components of the high-constructive Sparta delta system in east Texas are delta plain (distributary channel-fill sandstone and interdistributary mudstone), delta front sandstone, and prodelta mudstone. All of these facies are present in outcrop and subsurface; the prodelta facies, however, are thin and poorly developed in the outcrop belt. The interrelationships of these facies in subsurface and the areal distribution of Sparta depositional systems are illustrated by figures 3-7 and 17, respectively.

Based on sandstone percentage distribution within the Sparta Formation, Payne (1969) determined that these strata in east Texas, Louisiana, Mississippi, and southern Arkansas were deposited in a "fluvial deltaic plain" environment. He noted that the delta represents the record of an ancestral Mississippi River system that existed during deposition of the Sparta and possibly during deposition of much of the Claiborne Group. Sandstone facies are well developed along a general northerly trend, presumably normal to the orientation of the Sparta shoreline; the pattern of sandstone distribution was probably created by a system of anastomosing, constantly shifting stream channels and interlacing lakes, marshes, and swamps such as would be developed on a large fluvial deltaic plain.

Prodelta facies

Prodelta facies of the Sparta delta lobes are fine-grained, terrigenous, clastic sediments deposited from suspension seaward of the progradational delta-front sands. The prodelta mudstone facies are the initial terrigenous sediments deposited in the development of the delta. Hence, they thicken seaward and stratigraphically underlie the delta-front sandstone facies.

Dip cross sections (figs. 3-6) show that prodelta mudstone deposits progressively thicken downdip from very thin near the outcrop to several hundred feet thick in the deeper subsurface where the entire Sparta interval is composed of prodelta facies. Shelf mudstone facies of the subjacent Weches Formation can be differentiated from Sparta prodelta mudstone deposits (stratigraphically included in the Weches Formation) because the marly-glauconitic Weches shelf facies can be recognized on electric logs by a distinctive resistivity peak without corresponding response in the SP curve.

Several outcrops exposed along U.S. Highway 69, approximately 5-7 miles north of Jacksonville, Texas (fig. 19), exhibit a transition from the highly fossiliferous glauconitic shelf mudstone of the Weches Formation to the basal delta front sandstone bodies of the overlying progradational Sparta Formation. The thin transitional interval of interbedded sandy siltstone and sparcely to to non-fossiliferous mudstone represents the only evidence of prodelta facies in outcrop.

Delta front facies

Delta front sandstone deposits of the Sparta Formation include distributary mouth bars and marine reworked sheet sandstone facies. In east Texas the well developed delta front deposits are the dominant facies of the high-constructive delta systems. Delta front sandstone facies are the framework element that defines the geometry of the delta system.

Delta front facies are characterized by interbedded sandstone and mudstone sequences that become sandier upward. Thus, on electric logs these facies are characterized by an inverted christmas tree shaped spontaneous potential resistivity pattern (fig. 18). This pattern reflects a coarsening-upward sequence that is typical of progradational deposits and contrast with the sharp bases of scourbounded distributary channel sandstone deposits. Delta front facies grade downdip into prodelta mudstone facies and updip into delta plain deposits.

North of Tyler on Farm Road 14, approximately 12 miles from Loop 323; one mile north of the intersection of Farm Roads 20 and 14; two miles east of Centerville on Texas Highway 7; and seven miles southeast of Jacksonville on U.S. Highway 69 (fig. 20) are typical exposures of progradational Sparta sequences composed of horizontally interbedded silty sandstone and mudstone layers. Sandstone beds are composed of small scale tabular cross beds; the sequences become sandier upward with a corresponding increase in abundance and scale of cross-stratification.

wacke

high angle cross-stratification and foreset cross bedding

On U.S. Highway 69, two miles northwest of Rusk is exposed (fig. 21) a laterally persistent, well sorted, fine-grain sandstone unit with low angle cross-stratification composed of small scale tabular and foreset cross bedding. This deposit represents a channel mouth bar with a high degree of reworking by marine processes.

Delta plain facies

The delta plain part of the Sparta delta system, the subaerial part of the delta, is composed of distributary channel-fill sandstone and interdistributary mudstone deposits, which are at some places associated with lignite beds. The distributary channel-fill deposits are mostly fine-grained sandstone exhibiting trough-fill cross beds, tabular cross beds, a large amount of mud chips, and a symmetrical channel cross-section. The maximum thickness of individual channel-fill deposits is about 30 feet.

Delta plain facies were observed in most Sparta outcrops. Good exposures occur on U.S. Highway 69, 10 miles south of Alto where a distributary channel-fill clearly cuts a channel mouth bar deposit. The distributary channel-fill sandstone is characterized by a large amount of trough-fill cross beds and mud chips; the channel mouth bar deposits are of horizontally bedded sandstone containing tabular cross beds. Exposed on Farm Road 39, one-half mile south of Flynn (fig. 22) is a distributary channel-fill deposit composed of fine-grained sandstone, abundant mud clasts, and medium-large scale trough-filled cross beds in the central part (right side of the picture) of the channel. The cross-bedding decreases in scale toward the channel margins where ripple-drift cross-stratification becomes dominant.

Strandplain / Barrier-bar System, Central Texas

All well logs in the central coastal area of Texas (southwestern Fayette, La Vaca, Gonzales, Dewitt, Wilson, Karnes counties) show that the Sparta formation constitutes a single sandstone unit (figs. 9-10, 14-15), which has a maximum thickness of 100 feet updip, but thins downdip as it grades into shelf mudstone facies. This sandstone unit is very consistent laterally. Isolith patterns trend parallel to depositional strike, indicating tabular sandstone bodies that are characterized by coarsening upward sequences. These Sparta sandstone bodies resemble individual barrier-bar sand bodies of the high-destructive delta system of south Texas (fig. 14). Such sequences are similar to modern shoreface deposits associated with barrier bar and strandplain sands (Hayes and Scott, 1964; Bernard and LeBlanc, 1965; Bernard and others, 1970). Upward increases in number, grain size, and thickness of sandstone beds are well shown by SP-log profiles (figs. 9-10, 14-15).

Although exposures are poor, sandstone deposits of this strandplain / barrier-bar system are light-colored, friable, fine-grained, and well sorted. Primary sedimentary structures are very low angle, tabular cross-beds, small-scale trough-filled cross beds, and wave rippled cross beds.

The net sandstone pattern of the Sparta strandplain/barrier-bar system, its parallelism to depositional strike, and the absence of evidence of updip sediment sources imply that these deposits developed between the east and south Texas deltaic areas. The sediments in the system were transported southwestward by prevailing southwestern longshore currents from reworked shoal-water, delta-front deposits of the eastern high-constructive delta system of the Sparta Formation.

The above characteristics closely resemble the strandplain / barrier-bar systems of the Jackson Group (Fisher and others, 1970), Yegua Formation (Fisher, 1969), and the strandplain system of the Queen City Formation

(Garcia, 1972); Holocene analogues are the Texas barrier-bars and the strandplain system of the Nayarit coast of Mexico (Curray and others, 1969).

On the basis of sandstone percentage trends exhibited by the Sparta Formation, Payne (1968) inferred two principal types of relict depositional environments. He defined a distinctive area in Louisiana, Mississippi, southern Arkansas, and eastern Texas which includes the high-constructive Sparta delta system of east Texas described herein; and other area extending from Grimes to Webb counties, Texas. Payne noted that in the latter area of central and southern Texas, the long axes of the sandstone isopach patterns indicate that sand bodies are parallel to the postulated Sparta strand line. Payne also noted that the thickness of the Sparta Sand in south-central Texas is uniform, but in Arkansas, Mississippi, Louisiana, and east Texas thicknesses are extremely variable; and that the down-dip extent of sandstone in the formation is much less in central Texas than in east Texas and Louisiana. Hence, Payne concluded that the orientation of the sandstone bodies parallel to the strandline, the uniform thickness of the Sparta interval, and the smaller down-dip extent of sandstone, all suggest that the Sparta Formation in central and south Texas was deposited predominantly as near-shore bar and beach deposits. This contrasts with the inferred fluvial environments during Sparta deposition in east Texas and Louisiana.

Payne's (1968) interpretation for central and east Texas basically agrees with the results of the present study. The present study, however, indicates that the south Texas area received local fluvial sediment input, which resulted in deposition of facies that constitute a high-destructive, wave-dominated delta system. Two basic factors influenced this different interpretation:

1. The upper and lower boundaries of the Sparta depositional cycle is imprecise, and, therefore, sandstone percentage mapping used by Payne is more subjective than net sandstone mapping used in this study.

2. Because Payne used sandstone percentage maps, he apparently did not recognize the significance of high net sandstone concentrations in the south Texas area, which requires a local fluvial sediment supply (high-destructive, wave-dominated delta system); and data in the southernmost part of the area (Zapata county) was not available during Payne's investigation.

<u>High-Destructive, Wave-Dominated Delta System, South Texas</u>

A high-destructive Sparta delta system developed in south Texas in western Atascosa, western Live Oak, McMullen, LaSalle, Webb, and Zapata Counties; and it extended southward into Mexico.

Coastal barrier sandstone facies, lagoonal mudstone facies and prodelta-shelf mudstone facies have been recognized in the Sparta delta system of south Texas. The Sparta system can be recognized by the distinctive sandstone distribution pattern (fig. 16), which is similar to the Upper Wilcox Group and Yegua Formation (Fisher, 1969), and Queen City Formation (Garcia, 1972), where sandstone maxima are oriented parallel to the regional depositional strike. The facies interpretation agrees with outcrop observations and former outcrop studies (Towbridge, 1932; Kane and Gierhard, 1935; Patterson, 1942, Lonsdale and Day, 1937; Lonsdale, 1935). Modern examples of high-destructive, wave-dominated deltas are the Holocene Rhone, Po, Nile, Grijalva and Pleistocene Surinam systems (Fisher and others, 1968).

The thick sand deposits that comprise the wave-dominated Sparta delta system were initially recognized by Gardner (1932), who argued that the Cook Mountain Formation in east Texas was mostly fossiliferous clay but in south Texas was composed of thick, fossiliferous sand deposits. She recommended the name of Laredo Formation for these Sparta-equivalents of south Texas.

Coastal barrier and channel-mouth bar facies

Coastal barrier bar-strandplain sand facies associated with high-destructive delta systems are formed by the reworking of channel-mouth bar sand deposits by waves and currents and redeposition of the sand along strike marginal to the channel-mouth. The resulting deposits form arcuate to cuspate sand bodies (fig. 23). Although most of the final sand deposition is in the form of barrier-bars, some channel-mouth bar facies are preserved. Coastal barrier and channel-mouth bar sand facies can be differentiated by the SP curve on electric logs. Channel-mouth bars generally display a gradual transition upward from prodelta/shelf facies to box-like SP shapes. The barrier bars, on the other hand, show more abrupt coarsening upward sequence which is characteristic of shoreface deposits (fig. 18). Chanel-mouth bars are restricted to river discharge areas where maximum fluvial sand deposition occurs.

Mud is deposited in narrow, discontinuous, elongate lagoons on the landward side of the barrier bar or strandplain contemporaneous with delta construction. The Sparta high-destructive delta system of south Texas does not posess a well defined updip lagoonal facies. The deltaic sandstone bodies are connected updip to supporting fluvial systems and contain local progradational sequences, similar to the Upper Wilcox deposits in Texas (Fisher, 1969).

Coastal barrier and strandplain facies in the high-destructive Sparta delta system are stacked vertically, and individual sandstone bodies are characterized by a coarsening upward sequence composed of shoreface deposits. Barrier/strandplain sandstone bodies are 30 to 100 feet thick, are better developed southward within the system. A southward cuspate trend in net sandstone (fig. 16), is a good indicator of a well developed southwestward longshore current during Sparta deposition.

Outcrop studies (Lonsdale, 1935; Lonsdale and Day, 1937; Patterson, 1942, Towbridge, 1932) of the undifferentiated Sparta-Cook Mountain Formations (Laredo Formation, fig. 2) in south Texas provide evidence of barrier bar/strandplain facies and associated lagoonal strata. Earlier workers describe the Laredo Formation as consisting of sandstone, gypsiferous clay, impure limestone, and lignite. Much of the sandstone is glauconitic and crossbedded. In some exposures the glauconitic deposits are calcareous and are essentially an impure marly limestone. Fossils within calcareous concretions are scattered throughout the formation in south Texas. Patterson (1942) interpreted such sediments as indicative of offshore bar deposition associated with landward lagoonal muds and seaward shelf muds.

Examples of coastal barriers that are associated with high destructive delta systems are the modern Niger delta (Allen, 1965), Apalachicola delta system of northwestern Florida (Fisher _et_. _al_., 1969), Rhone delta (Oomkens, 1970), the Po and Danube deltas (Fisher, 1969), and the Holocene Grijalva delta in Tabasco, Mexico (Psuty, 1967) and the Nayarit coastal plain in Mexico (Curray and others, 1969).

Lagoonal facies

Lagoonal facies are developed landward of coastal barriers and between elevated strandplain beach ridges. Sedimentation in this environment is slow; wind-transported sand, clay deposited from suspension, storm washover fans (sand), and biogenic activity (burrowing and root mottling) may be important processes, depending on local conditions. Salinity is influenced by fluvial discharge, storm inundations, evaporation, and tides. In general, lagoons are brackish and contain abundant molluscs, and low to moderate species diversity. In highly restricted lagoon environments, gypsum and other evaporites are precipitated. The resulting lagoonal deposits are composed of thinly bedded or bioturbated sands, silts, muds, locally gypsiferous muds and a large number of molluscs.

Lagoons associated with high-destructive delta systems occur in the modern Apalachicola delta (Fisher, 1969); the modern Po delta system (Fisher, and others, 1969); and the Holocene coastal plain of Nayarit, Mexico, which is formed of elongate muds swales and associated coastal barriers (Curray, and others, 1969).

On Texas highway 44, five miles west of Encinal, in an excavation on private land, are lagoonal Sparta deposits composed of thin-bedded sandstones, siltstones, mudstones, and some gypsum laminations (fig. 24). Some beds show ripple cross-stratification, and other beds are highly bioturbated. Shell concentrations form calcareous concretions (fig. 25). The lagoonal deposits abruptly overlie sandy deposits of barrier origin.

Prodelta/shelf facies

Prodelta facies consist of fine-grained, terrigenous, clastic sediments deposited from suspension seaward of progradational delta front sands (or coastal barrier sands). These sediments are the initial deposits in the development of the delta; they thicken seaward and stratigraphically underlie the coastal barrier sands (figs. 11-13). Under high wave influence (high-destructive, wave-dominated deltas) where slow deposition and extensive bioturbation occur, prodelta and shelf environments are similar and, for this reason, they cannot be differentiated. Hence, the term prodelta/shelf is applied to these facies.

The higher wave (marine) influence causes a greater similarity between the prodelta and shelf environments. Thus, the differentiation between prodelta mudstone and shelf mudstone facies is difficult, if not impossible. High marine influence permitted the development of a benthonic fauna and, consequently, resulted in highly bioturbated prodelta mudstone deposits similar to shelf facies.

Shelf Depositional System

The term shelf, as used in this report, denotes a depositional environment which is characterized by a very slow rate of deposition, implying an absence of significant terrigeneous clastic sediment supply. Therefore, shelf sediments are the result of reworking of relict sediments by marine physical and biological processes. They are mostly of a muddy character, extensively bioturbated, and may include biogenic and chemical components (glauconite, phosphorite, carbonates), as well as a diversified fauna. Studies of modern shelves, such as those of Curray (1965), Emery (1968), and Uchupi (1968) have provided an insight into shelf processes and resulting deposits.

Shelf sediments are deposited primarily during destructive stages of delta development, and in a regional scale they represent a physical boundary between genetic units of clastic progradations. The deltaic and strandplain/barrier-bar systems of the Sparta Formation are overlain and underlain respectively, throughout most of Texas by the Cook Mountain and Weches Formations, the lower parts of which are highly fossiliferous, marly, glauconitic mudstone of shelf origin. Throughout east Texas, prodelta mudstone facies in the upper parts of the Weches and Cook Mountain Formations are distinctively differentiated from underlying shelf mudstone deposits because the marly character of the shelf facies provides a very consistent and diagnostic peak in the resistivity curve of electric logs (figs. 3-7, 14, 15). This differentiation occurs, therefore, because the high rate of progradation of the high-constructive system produced a drastic change in environmental conditions from shelf to prodelta environments resulting in deposition of non-fossiliferous prodelta muds on highly fossiliferous shelf muds of the Weches. Formal stratigraphic divisions do not make this genetic facies differentiation.

Sediment Dispersal

Two basic types of sediment dispersal systems were operating during deposition of the Sparta. Within the high-constructive delta of east Texas, the dispersal of sediment was predominantly in a dip direction by fluvial processes; within the strandplain / barrier-bar system of central Texas and the high-destructive delta of south Texas, sediment dispersal was along strike by longshore drift. (Ricoy, 1976) Clastic sediments were introduced into the Gulf basin of Texas during Sparta time in east and south Texas. Principal clastic deposition was concentrated within high-constructive delta systems of east Texas, Louisiana and Mississippi (Payne, 1968).

In south Texas, the sediments were introduced into the Gulf basin by a series of small stream complexes (fig. 26), which supplied a high-destructive, wave-dominated delta system, essentially composed of coastal barrier sands and associated lagoonal muds. the area of the outcrop In east Texas the sediments were introduced by a major integrated stream complex, which derived sediments from an extensive drainage area in the U.S. continental interior. This sediment was deposited within a high-constructive delta system as delta front sands, prodelta muds, and delta plain deposits such as distributary channel-fill sands, floodbasin/interdistributary bay assemblages, crevasse splay deposits and rare lignite deposits. This deltaic system extended eastward into Louisiana, Mississippi, and Arkansas, where the Sparta deltaic deposits are much thicker than in east Texas.

Reworked shoal-water, delta-front sands of east Texas were transported toward central Texas by prevailing southwestward longshore currents and supplied the strandplain/barrier-bar system of that region. They also contributed to a small degree in the construction of the high-destructive, wave-dominated delta system of south Texas.

COMPARISON WITH OTHER DEPOSITIONAL SYSTEMS

The composition, distribution, and relationship of facies within the various Sparta depositional systems are similar to Eocene deposits of the Queen City Formation (Guevara, 1972; Garcia, 1972), Jackson Group (Fisher and others, 1970), lower part of the Wilcox Group (Fisher and McGowen, 1967), and Yegua Formation (Fisher, 1969) shown on figure 27. All of these Eocene clastic units are characterized by a high-constructive delta system in east Texas. Except for the Jackson and Queen City, the Eocene deltaic systems extend into Louisiana. These systems are also comparable to the Holocene Mississippi fluvial delta system and its related strike systems of the northwestern Gulf of Mexico.

In central Texas all of the above-mentioned Eocene units are composed of strike-fed deposits that form strandplain/barrier-bar systems. In south Texas, as in central Texas, most Eocene sediments were deposited parallel to strike, forming barrier-bar facies and associated lagoonal mudstone facies. In the particular case of the Lower Wilcox the sediment source was the contemporaneous, high-constructive Rockdale delta system by way of southwestward longshore currents. In the other clastic units, the principal source of sediments in south Texas was local fluvial systems similar to those of the Sparta Formation. Strand-plain/barrier-bar deposits are the basic framework facies of the high-destructive, wave-dominated delta system.

NATURAL RESOURCES

The potential for economically significant occurrences of hydrocarbons in the Sparta Sand in Texas is low, although Heath and others (1931) noted the occurrence of oil in the Clay Creek salt dome in Washington County. This occurrence is of a very local extent and must be certainly the result of secondary structural development and migration.

The lack of oil accumulations may be explained by several factors which are related to the relatively thin Sparta progradational facies in Texas:

1. The unit (less than 700 feet) did not develop a sufficient thickness of prodelta muds to serve as adequate source beds;

2. The thin delta front/prodelta facies did not permit growth faulting to provide early fault closure and traps; and

3. In relation to the underlying and overlying progradational units, the thin Sparta sequence provided very restricted reservoirs for oil entrapment from secondary structural development and later oil migration.

The Sparta Sand is one of the major sources of groundwater in southern Arkansas, northern and central Mississippi, and eastern Texas as far as south Burleson County. However, from Burleson County southward in Texas the Sparta Sand is of minor importance as an acquifer because it con-

> tains fresh water only in a small area, yields are low, and the water is hard and has a high concentration of dissolved solids (Payne, 1969).

Based on electric log data, Payne determined the areal distribution of the dissolved-solids content of the Sparta, and from these chemical data determined regional chemical variations (based on proportion of anions) in the Sparta Sand (fig. 28). He defined three "chemical provinces":

1. Bicarbonate water that is distributed as a function of rate of water movement and time. That is, the greater the degree of flushing, the greater the proportion of bicarbonate;

2. Chloride waters that generally represent areas of discharge where the dominant component of flow is upward through a thick section of Cook Mountain clays and shales, and, in places, a shaly Cockfield (Yegua) section. Down dip movement of water is limited by the rapid pinch out of permeable beds of any appreciable thickness; hence, chloride waters lie beyond the limits of extensive flushing by fresh water; and

3. Sulfate waters that coincide closely with an area in which the formations overlying and underlying the Sparta Sand contain lagoonal gypsum and gypsiferous clays. The sulfate content can be attributed to the solution of gypsum by waters passing by these gypsiferous formations and the soils derived from them.

Comparing Sparta facies distribution with maps of the dissolved solid content and chemical provinces exhibited by the acquifer (fig. 28), it is clear that there is a very good correlation between the distribution of chemical provinces and the depositional systems within the Sparta. Thus, the distribution of chemical provinces can be seen as a reflection of the type of depositional environments operating during Sparta time: the bicarbonate waters reflecting fresh water influx along the dip oriented fluvial deposits in the high-constructive delta system of east Texas (and Louisiana, Mississippi, Arkansas); the sulfate waters reflecting restricted environments such as back-barrier lagoons of the strike-oriented strandplain / barrier-bar system of central Texas and of the high-destructive delta system of south Texas; and the chloride waters reflecting generally isolated delta front/prodelta sediments deposited under normal sea-water conditions. Of course, this picture is altered to some extent according to the degree of later flushing by meteoric water. The greater the movement of water, the greater the proportion of bicarbonate and the lesser the dissolved-solids content.

The downdip transmissibility for water-flushing is greater in the dip-oriented sandstone of east Texas than in the strike-oriented aquifer of south Texas. In the case of a considerable amount of water flushing, it would be expected that in east Texas the bicarbonate-chloride boundary would be farther downdip and dissolved solids content would be at lower levels than for the corresponding sulfate-chloride area of south Texas, but that is not the case (fig. 28). Hence, it appears that there has been a limited amount of water-flushing and that the different water types are closely related to water composition of the initial depositional environments. The water provinces are not the result of extensive later flushing by fresh-meteoric water. In other words, flushing by fresh water has altered only quantitatively (not qualitatively) the initial distribution of water types.

CONCLUSIONS

The Sparta Formation represents one of several Eocene lithogenetic cycles of fluvia-deltaic progradation into the Gulf Coast basin. During Sparta time there were two principal areas of sediment input: east Texas, Louisiana, Mississippi, Arkansas; and south Texas.

The Sparta deposits of east Texas compose a high-constructive delta system; equivalent deposits of south Texas constitute a high-destructive wave-dominated delta system; and Sparta deposits in central Texas compose a strandplain / barrier bar system. The high-constructive delta of east Texas supplied sediments that were transported southwestward by longhsore currents to form the strandplain/ barrier-bar system.

Sparta sediments prograded over transgressive shelf muds of the Weches Formation; following Sparta deposition, marine transgression resulted in deposition of shelf muds of the Cook Mountain Formation.

The thickness of the Sparta Formation in Texas is less than 700 feet, which did not allow the development of adequate source beds and structures favorable for subsequent oil entrapment.

Present distribution of chemical water types (and total dissolved solids) reflects the primary depositional environments of the Sparta system.

The initial study of depositional systems should be approached at a regional scale so that the interrelationships of component facies that define the depositional systems can be properly determined and mapped

Depositional systems provide a perspective of basin stratigraphy that permits prediction of stratigraphic relationships, sandstone geometry, potential and acquifer characteristic.

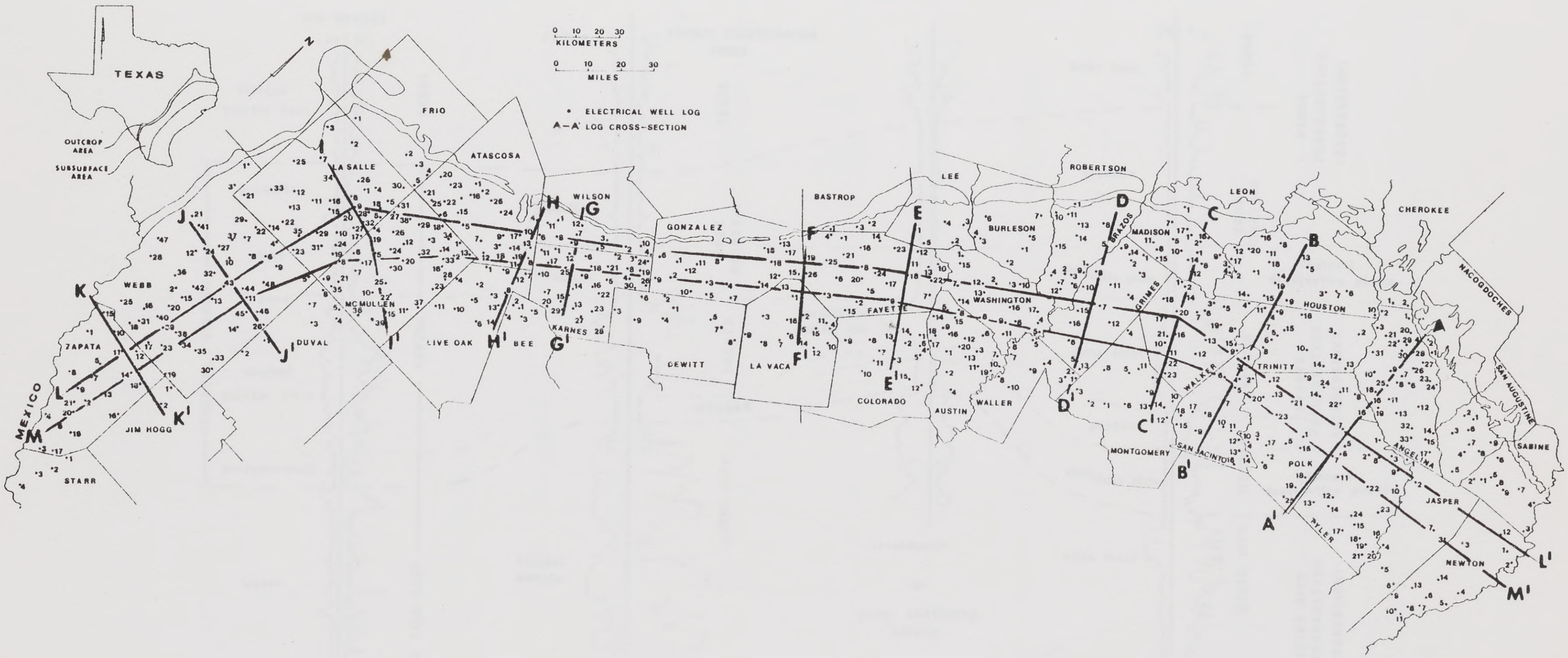

Figure 1. Location of wells and cross sections used in study.

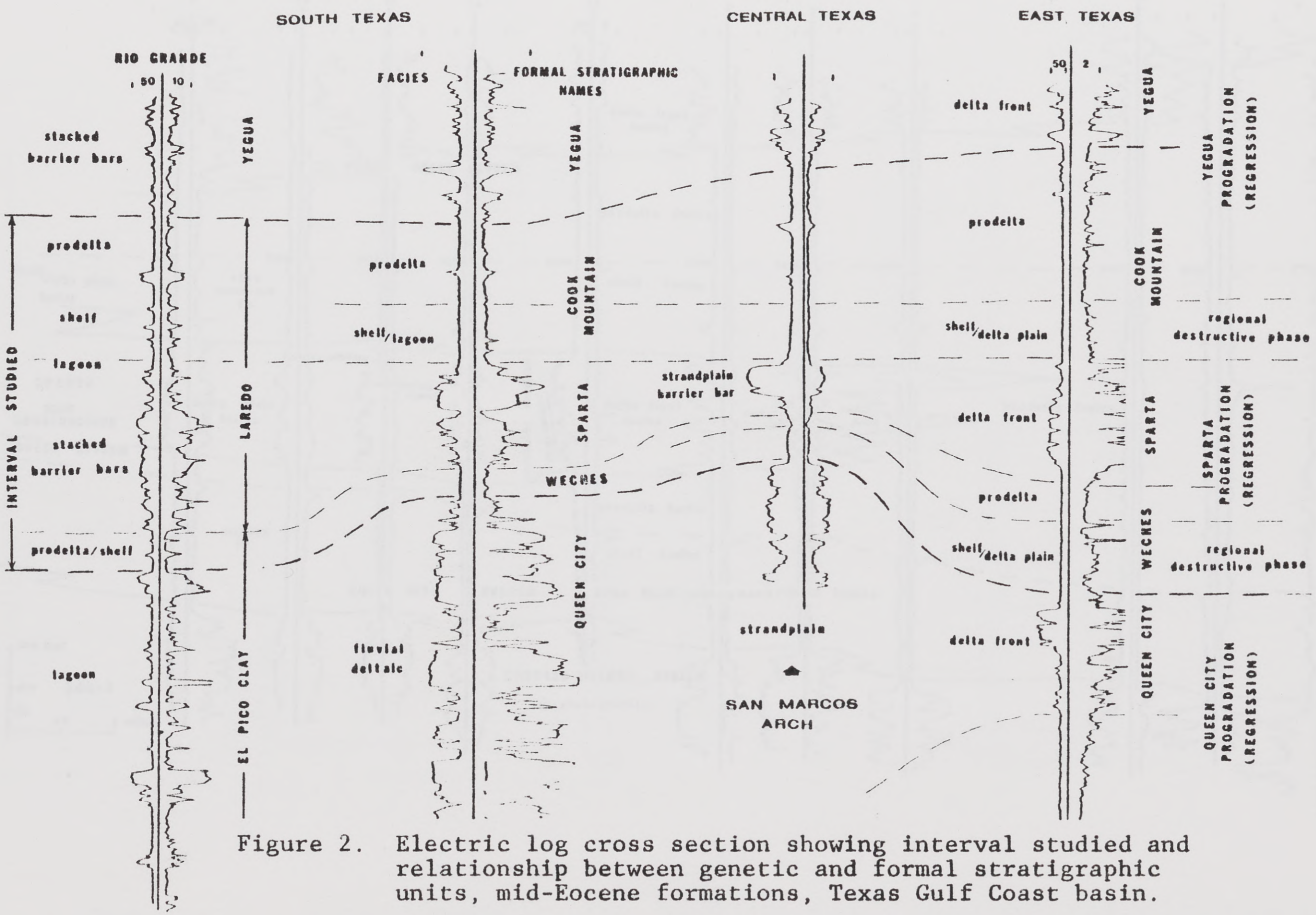

Figure 2. Electric log cross section showing interval studied and relationship between genetic and formal stratigraphic units, mid-Eocene formations, Texas Gulf Coast basin.

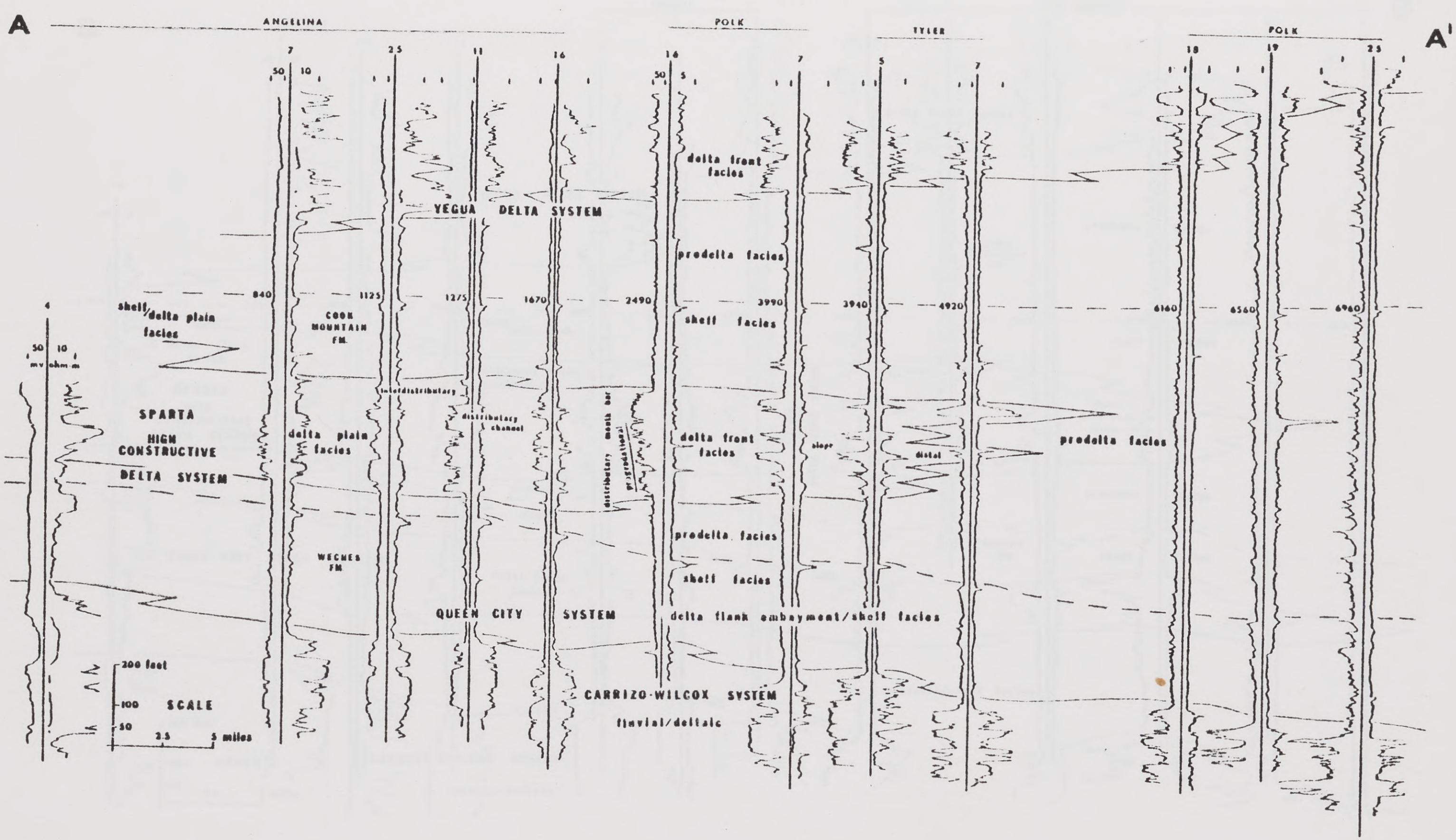

Figure 3. Stratigraphic dip section A-A' along Angelina-Tyler lobe, Sparta high-constructive delta system, east Texas.

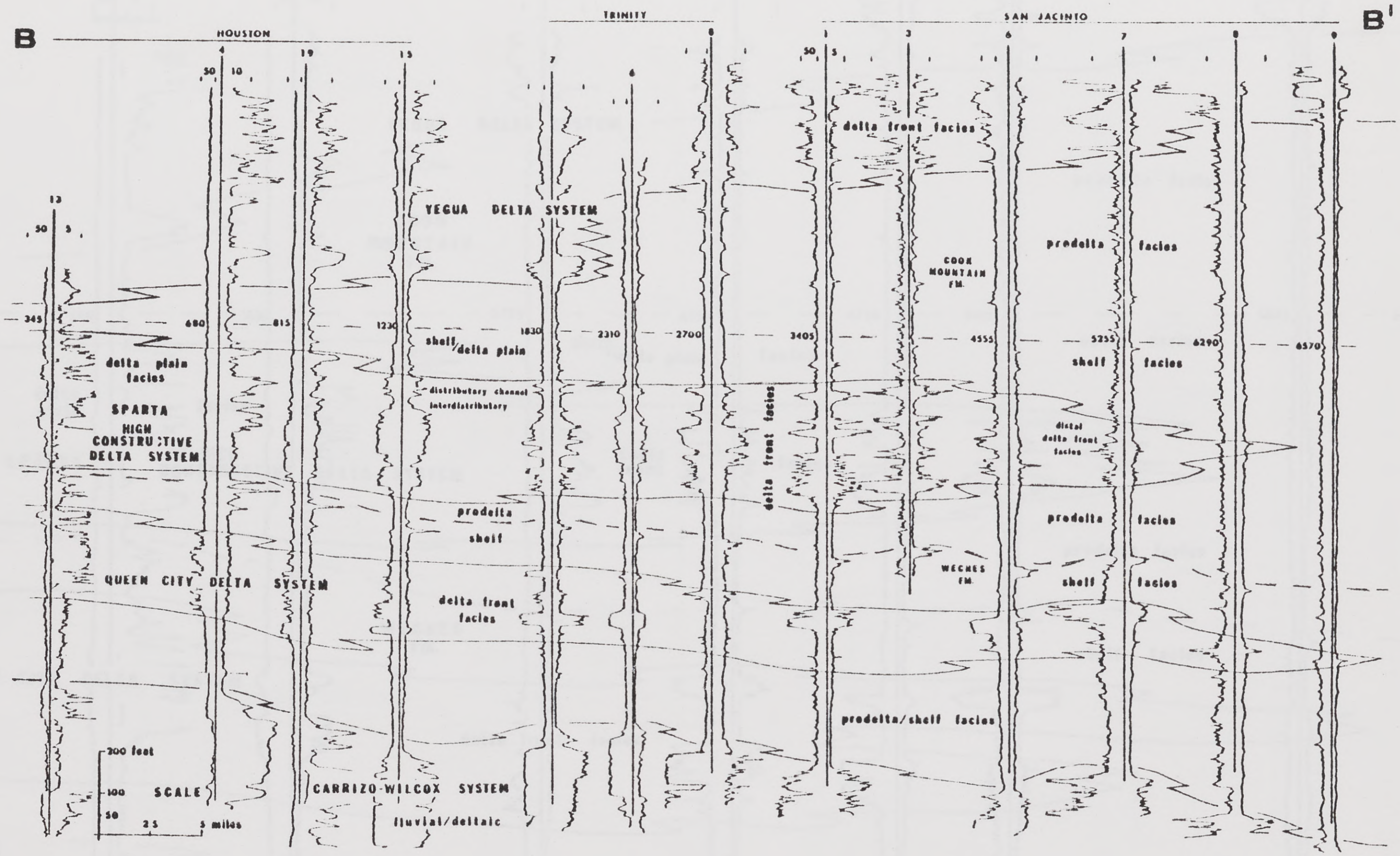

Figure 4. Stratigraphic dip section B-B' showing the different facies assemblages and the differentiation of prodelta from shelf facies, Sparta high-constructive delta system.

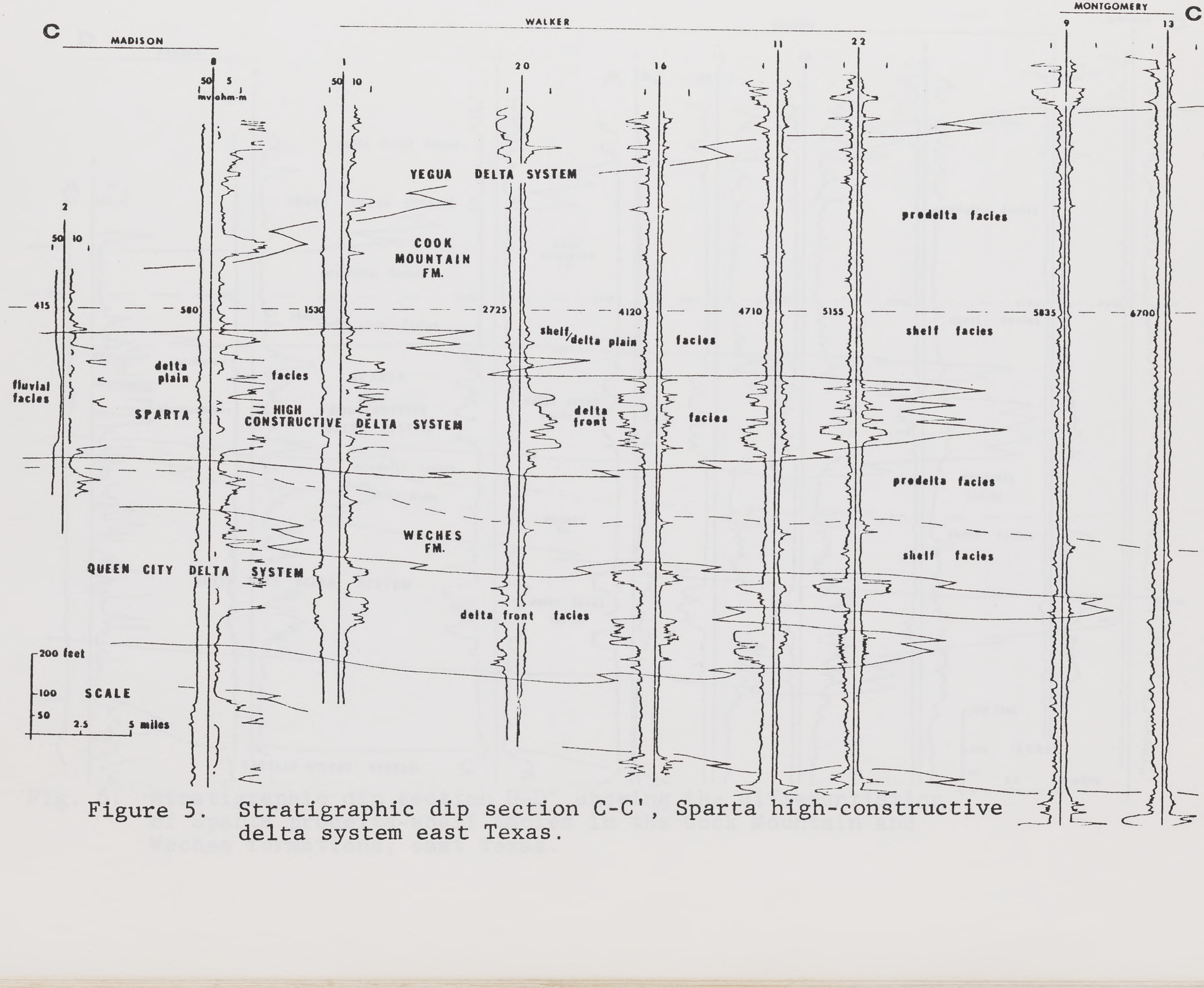

Figure 5. Stratigraphic dip section C-C', Sparta high-constructive delta system east Texas.

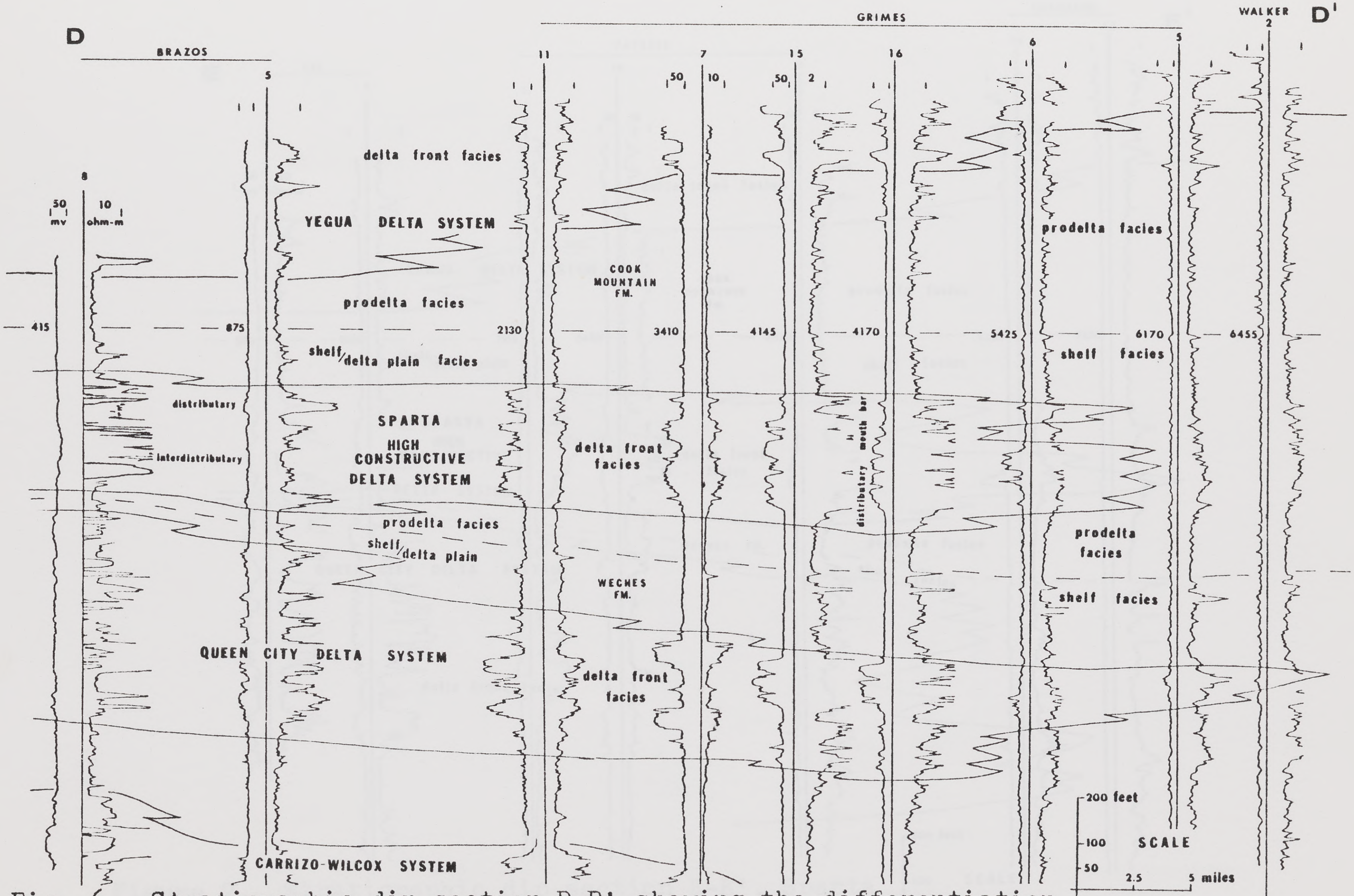

Fig. 6. Stratigraphic dip section D-D' showing the differentiation of Sparta prodelta-shelf facies in the Cook Mountain and Weches formations, east Texas.

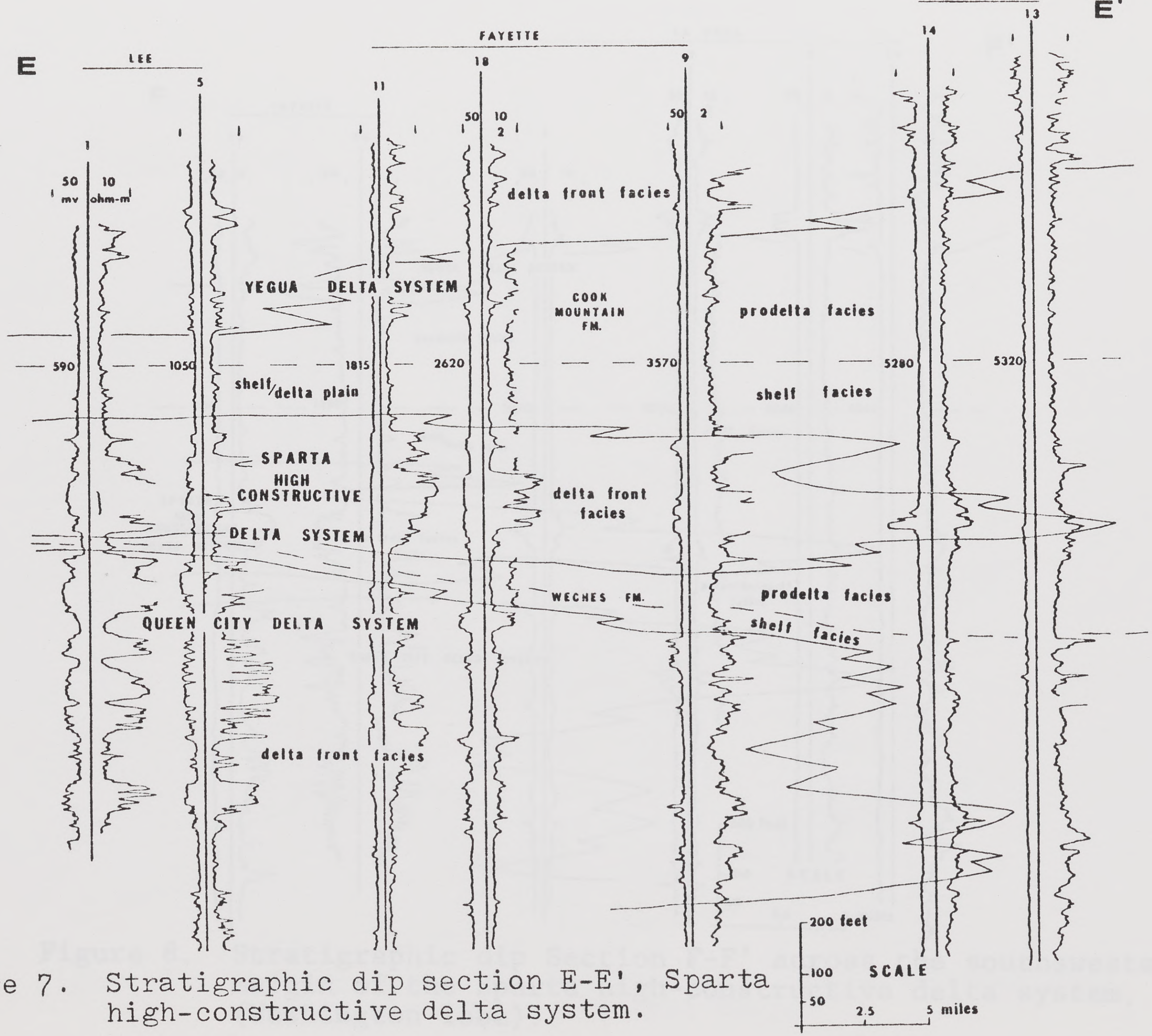

Figure 7. Stratigraphic dip section E-E', Sparta high-constructive delta system.

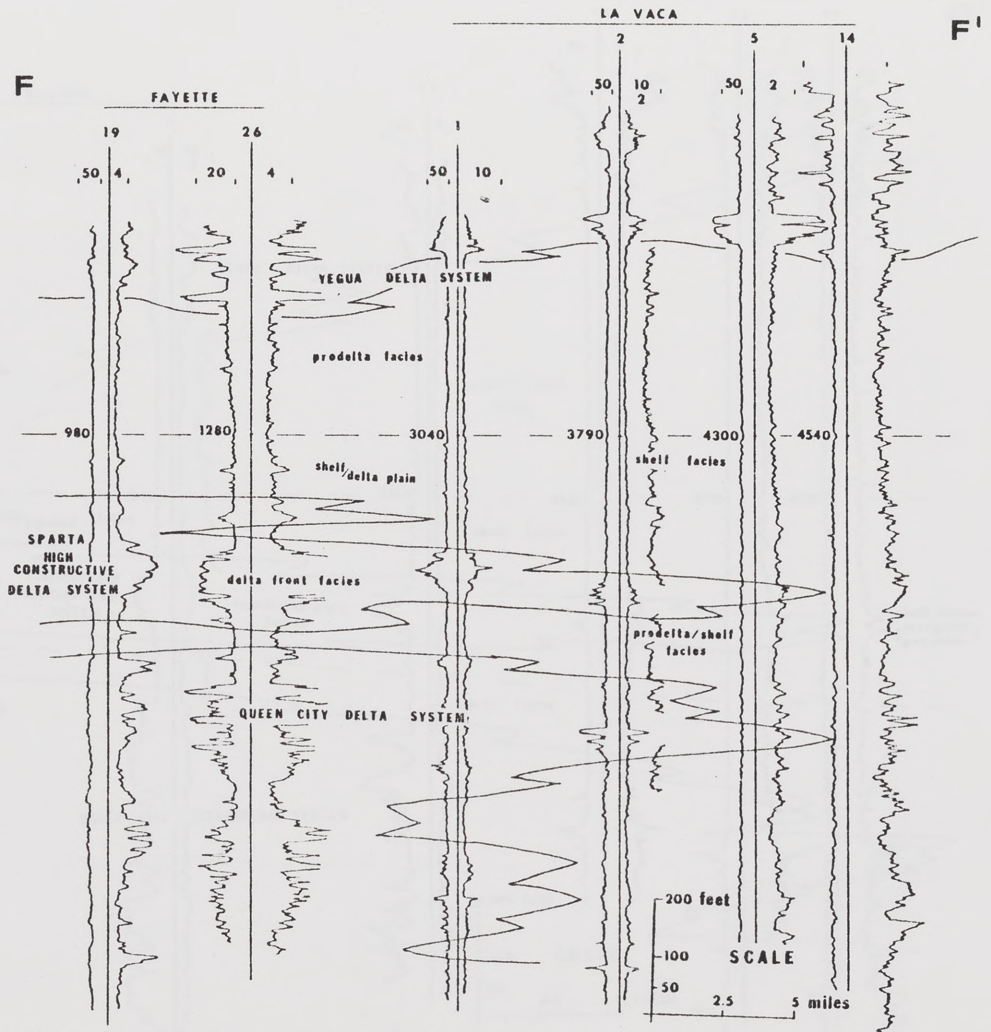

Figure 8. Stratigraphic dip Section F-F' across the southswestern margin of the Sparta high-constructive delta system, (Washington lobe).

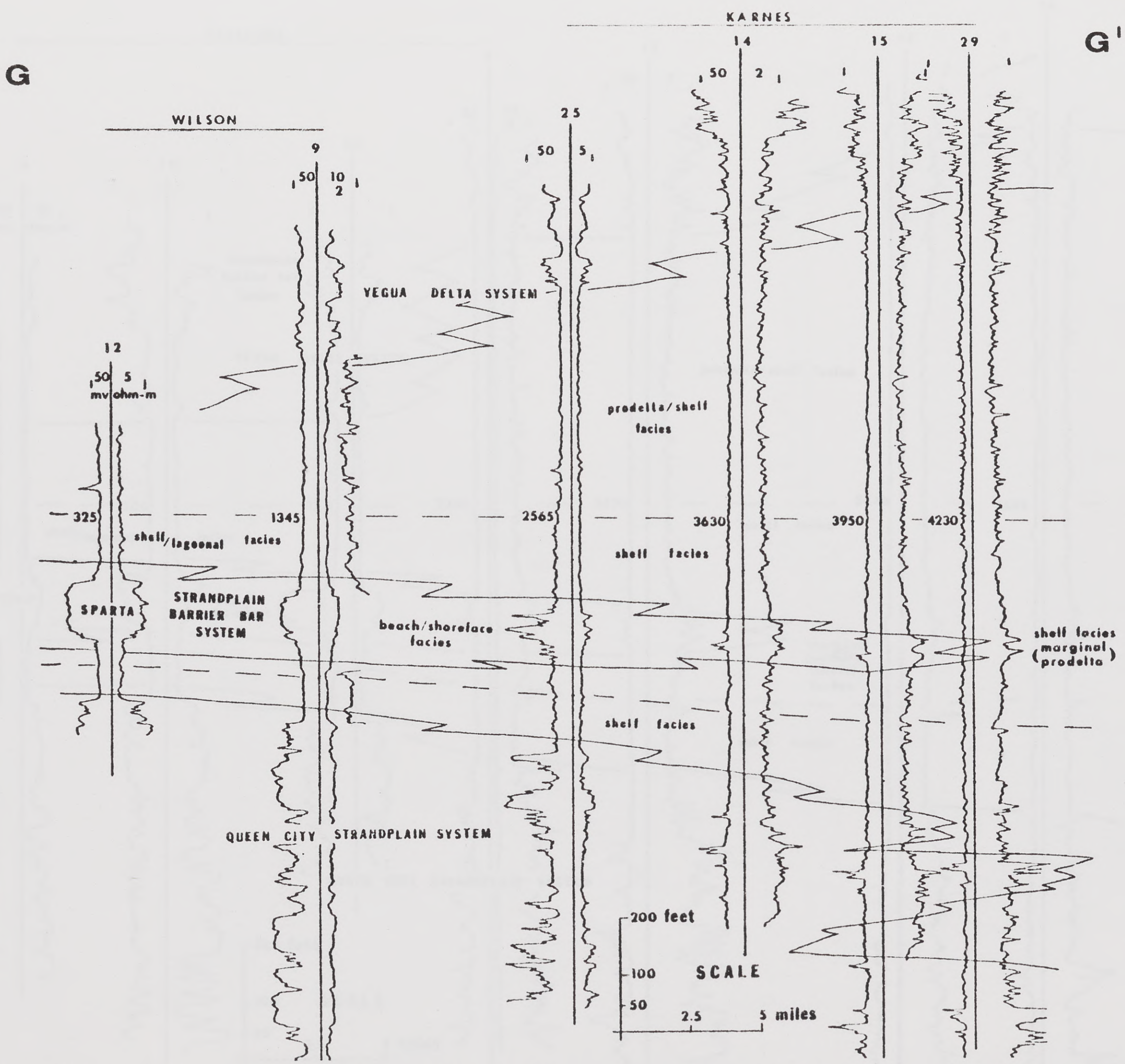

Figure 9. Stratigraphic dip section G-G', Sparta strandplain/ barrier-bar system, central Texas.

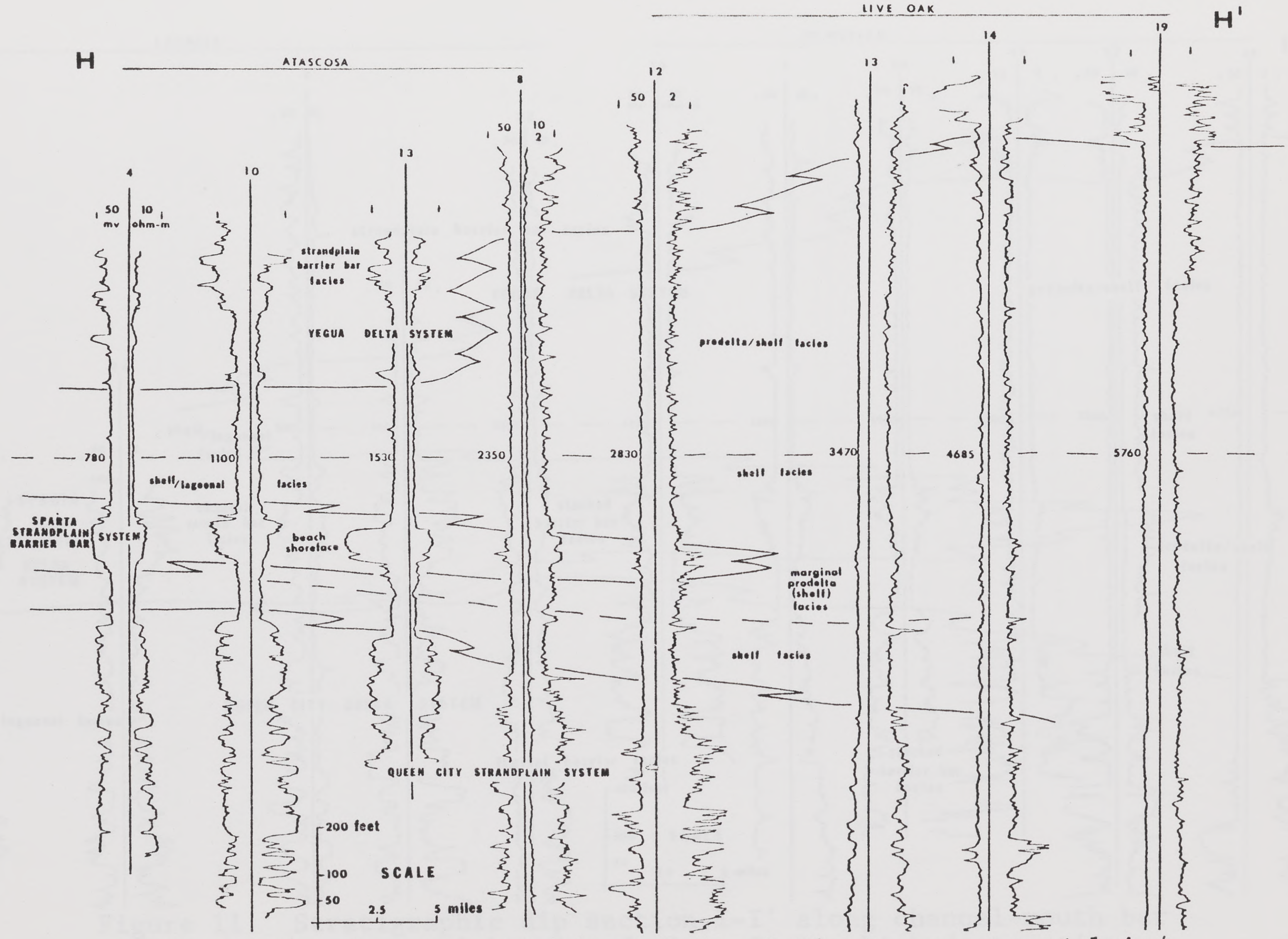

Figure 10. Stratigraphic dip section H-H', Sparta strandplain/barrier-bar system, central Texas.

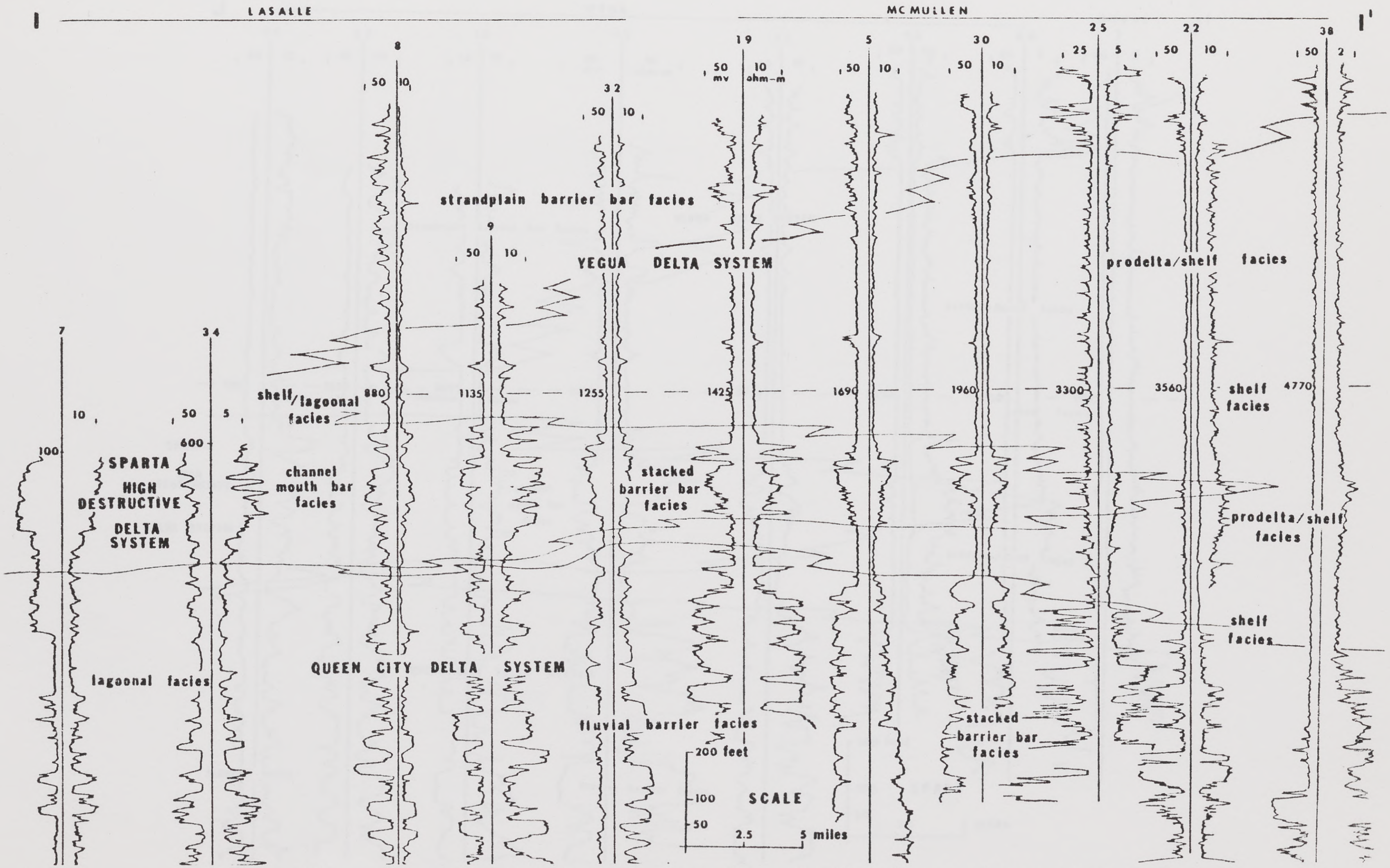

Figure 11. Stratigraphic dip section I-I' along channel-mouth bar and coastal barrier facies, Sparta high-destructive, wave-dominated delta system, south Texas.

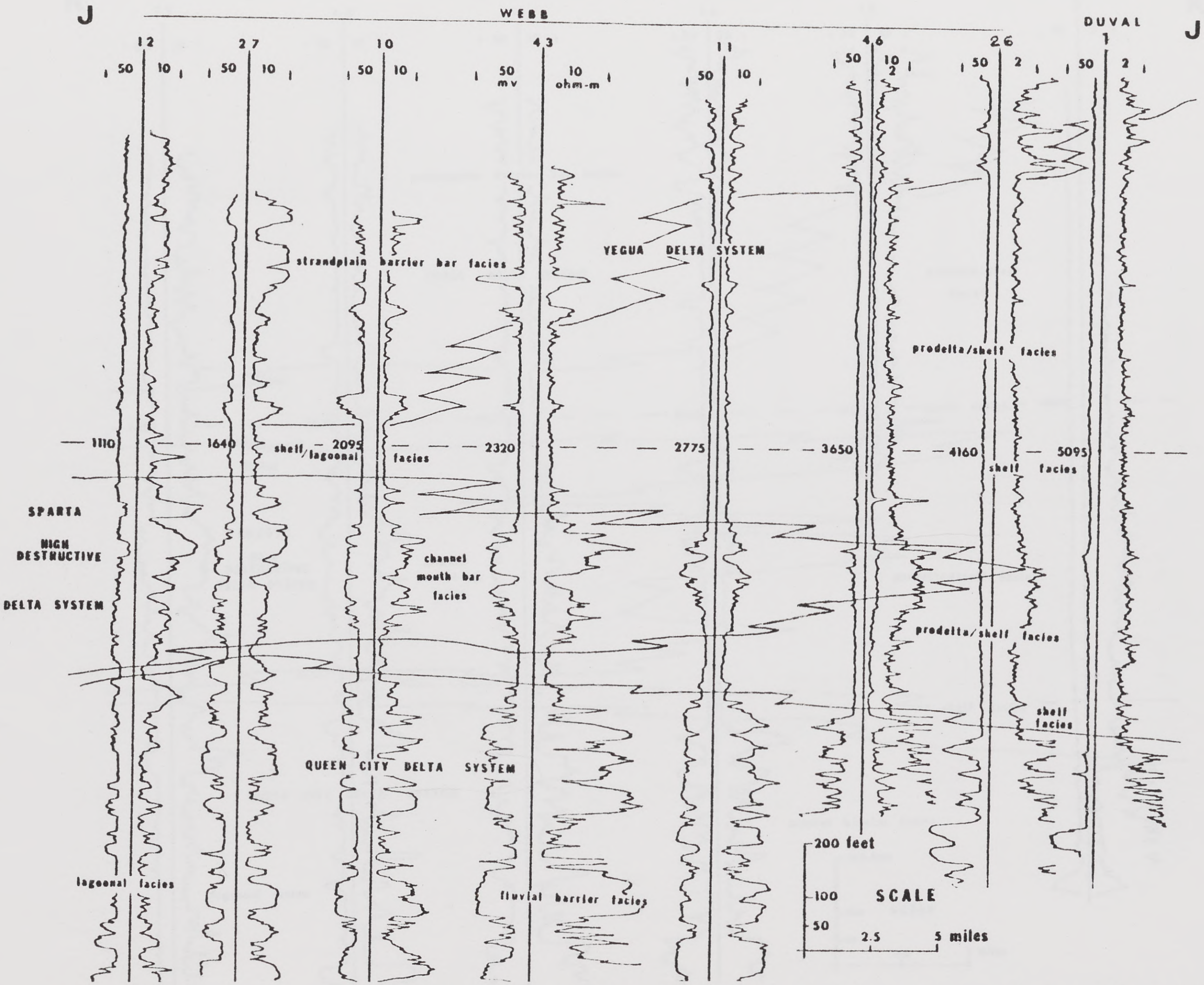

Figure 12. Stratigraphic dip section J-J' along channel-mouth bar facies, Sparta high-destructive delta system, south Texas.

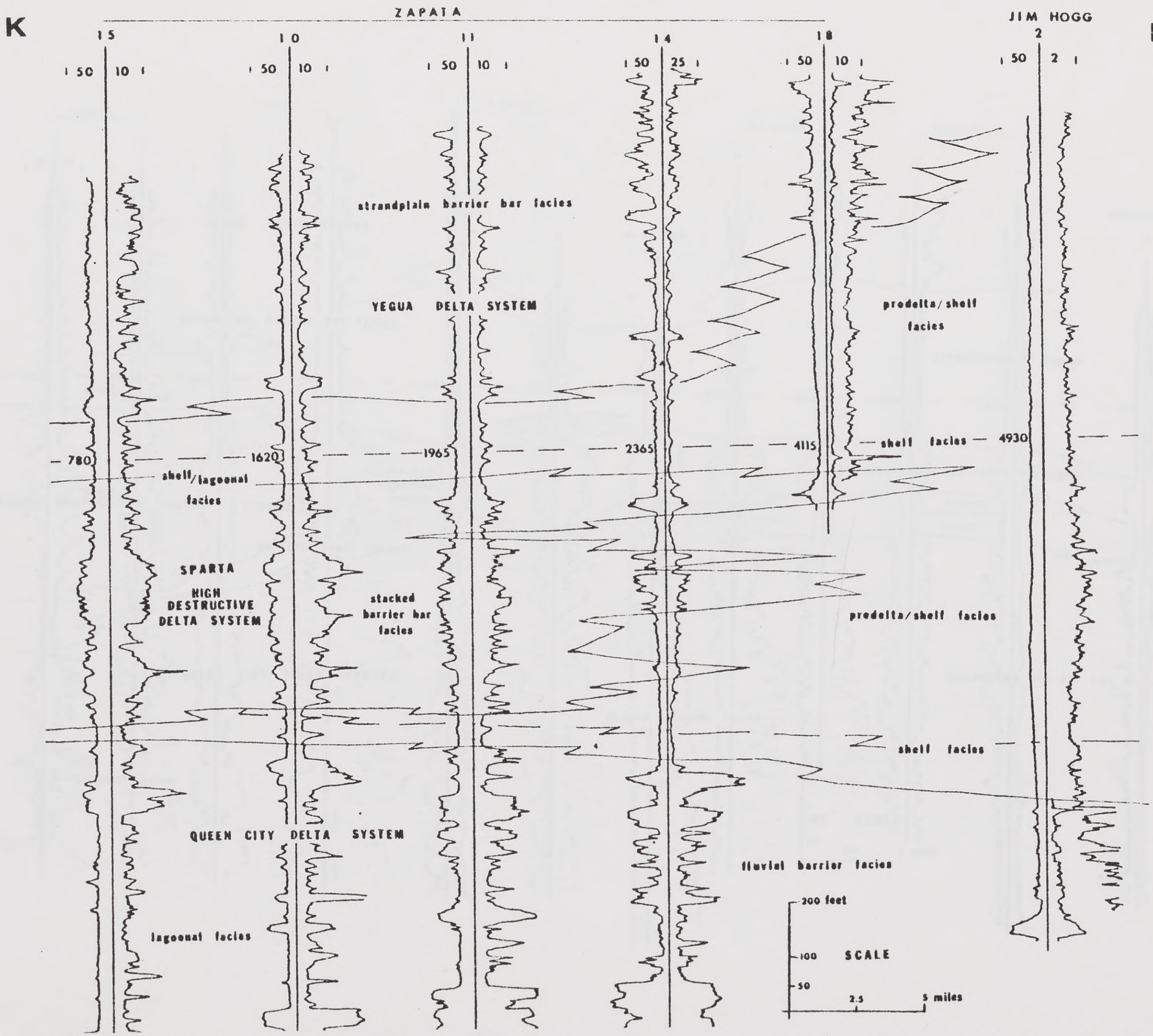

Figure 13. Stratigraphic dip section K-K' along stacked barrier-bar facies, Sparta high-destructive delta system, south Texas.

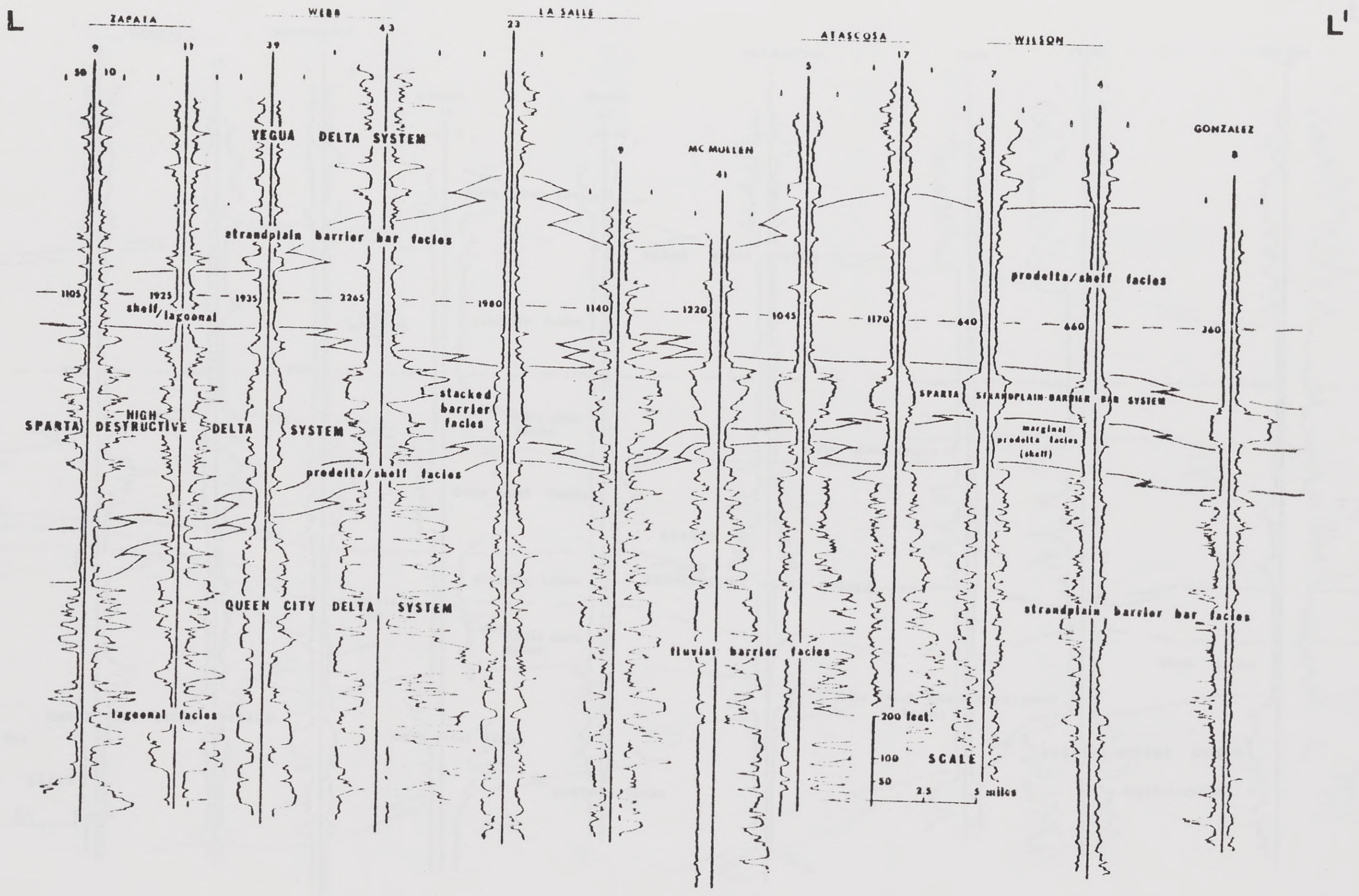

Figure 14a. Stratigraphic strike section L-L' across the high-destructive delta of south Texas and the strandplain/barrier-bar system of central Texas.

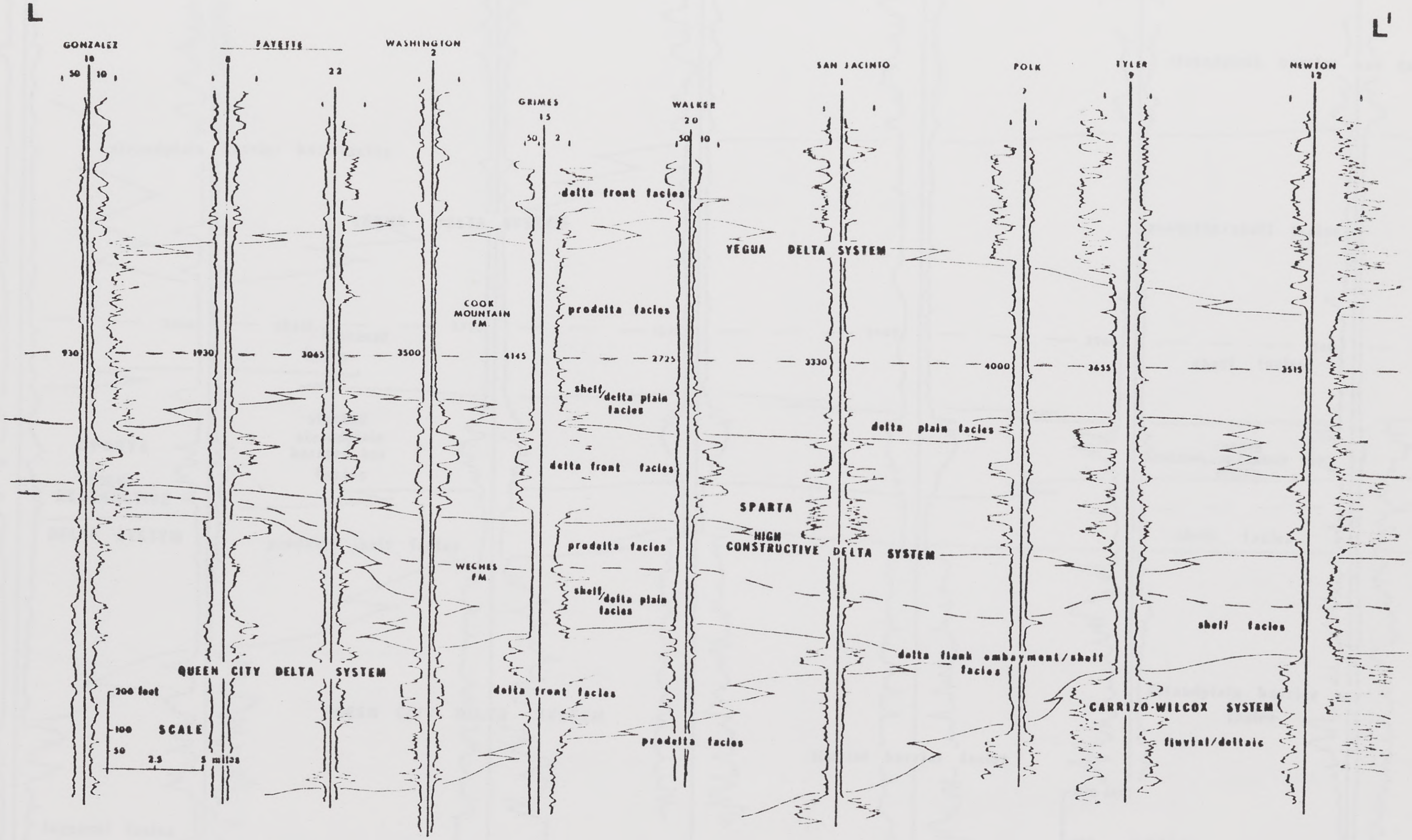

Figure 14b. Stratigraphic strike section L-L' across the strandplain/barrier-bar system of central Texas and the high-constructive delta system of east Texas.

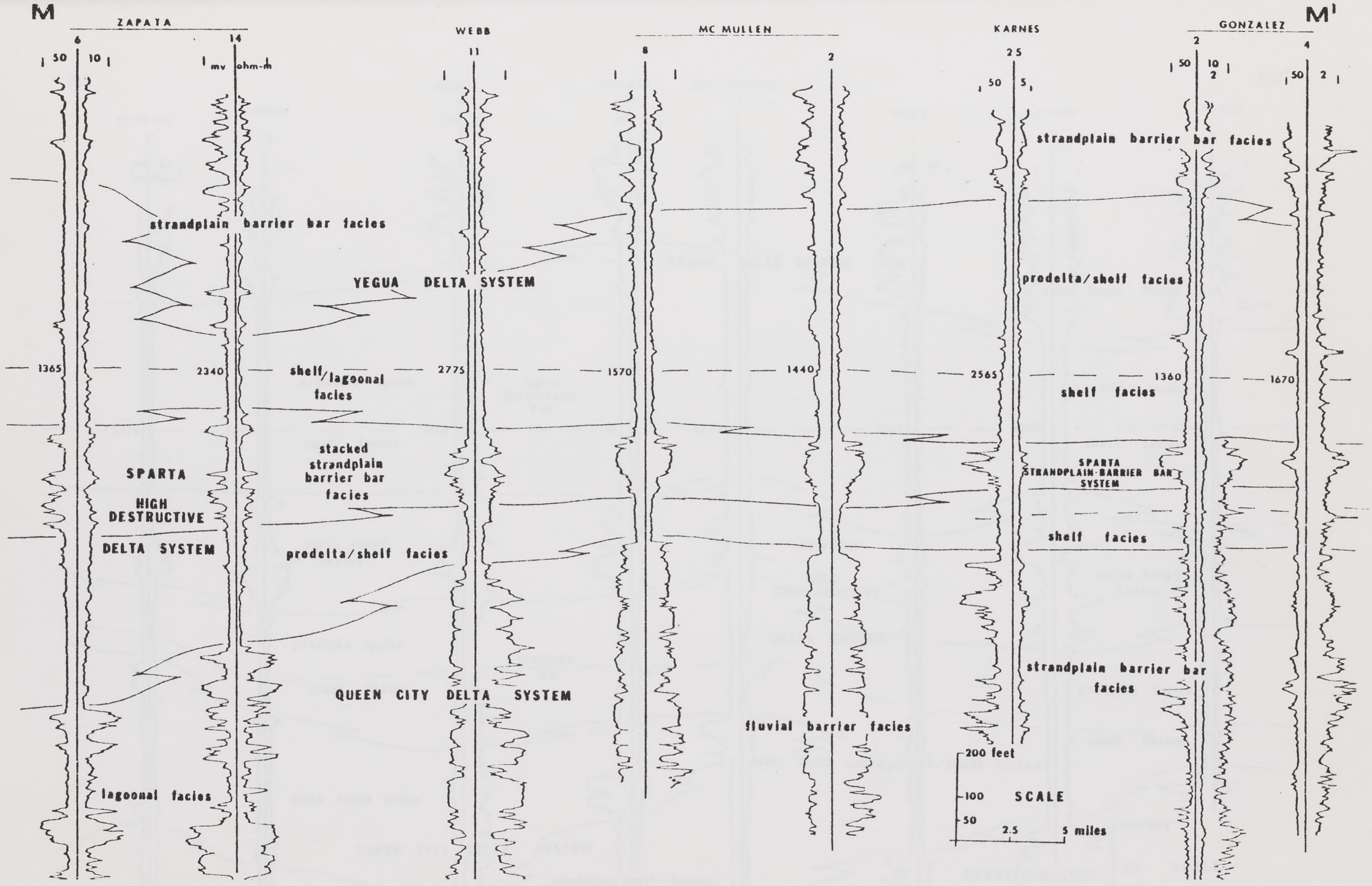

Figure 15a. Stratigraphic strike section M-M' across the high-destructive delta system of south Texas and the strandplain/barrier-bar system of central Texas.

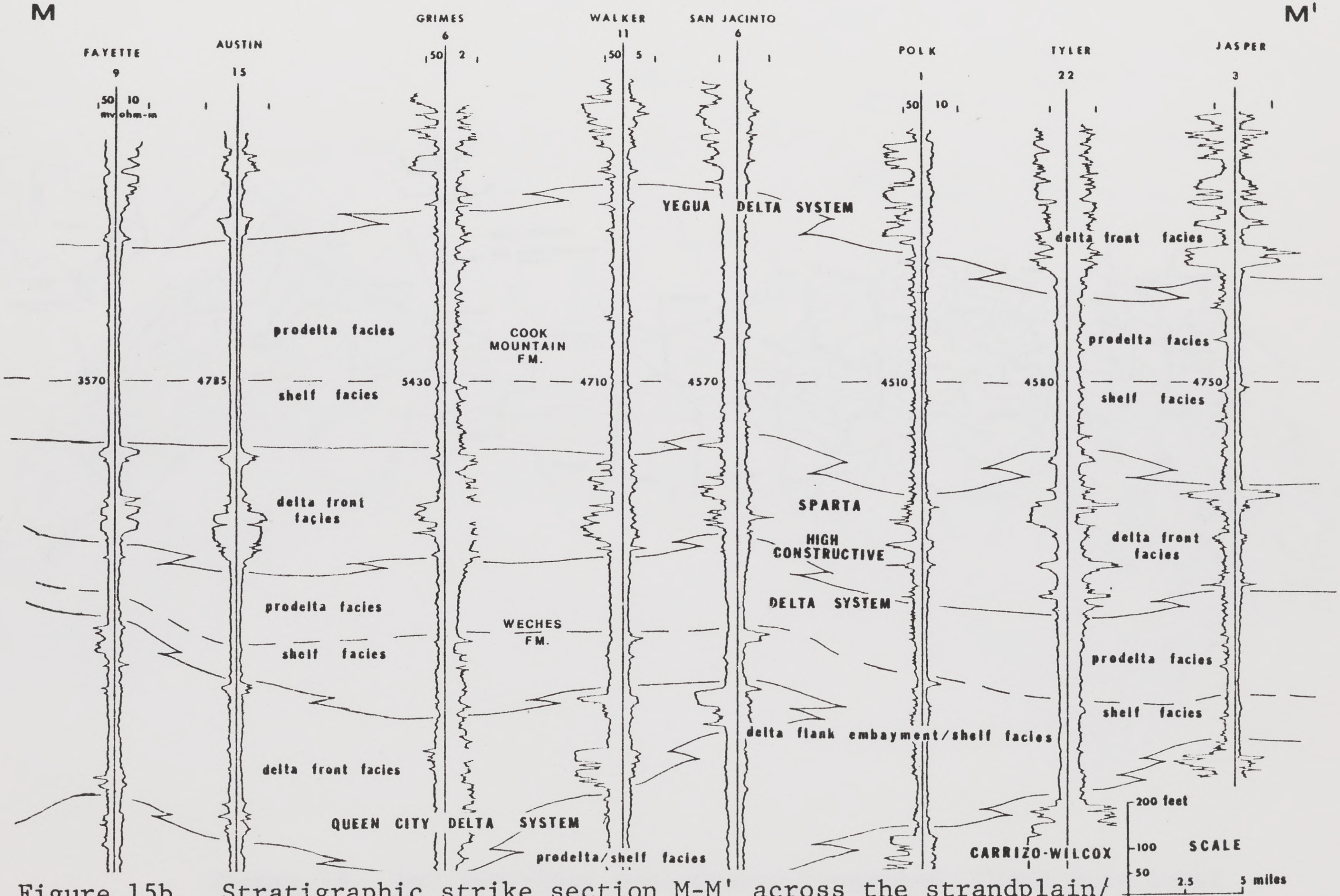

Figure 15b. Stratigraphic strike section M-M' across the strandplain/ barrier-bar system of central Texas and the high-constructive delta system of east Texas.

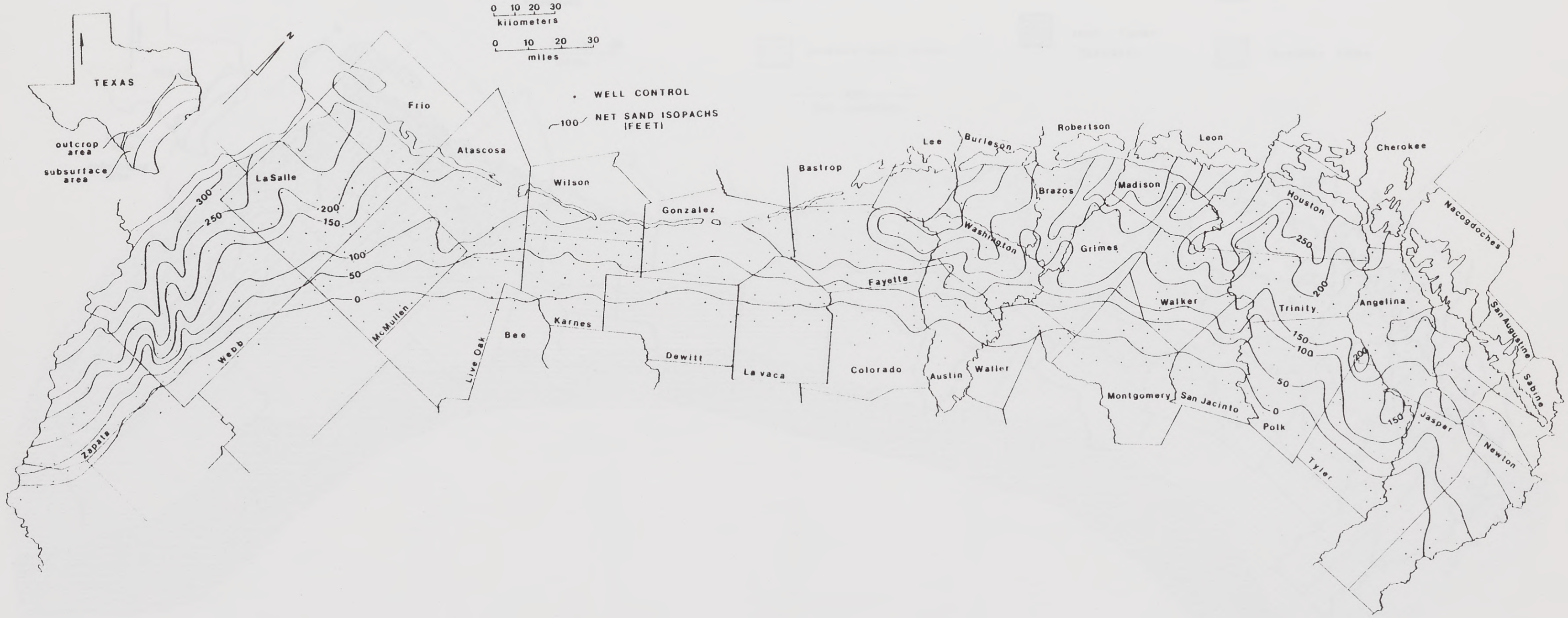

Figure 16. Net sandstone map, Sparta Formation, Texas Gulf Coast basin.

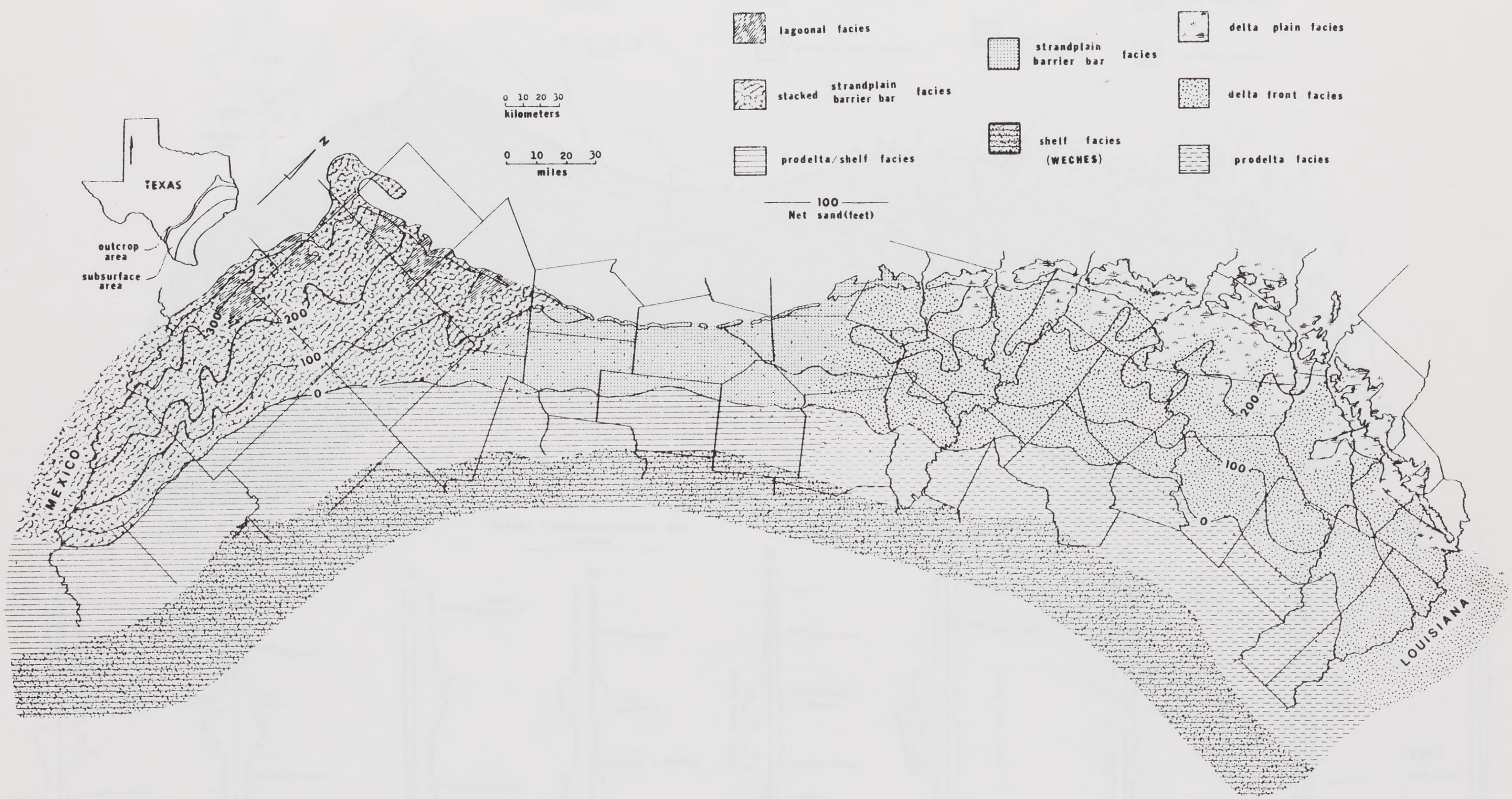

Figure 17. Areal distribution of principal facies, Sparta depositional systems, Texas Gulf Coast basin.

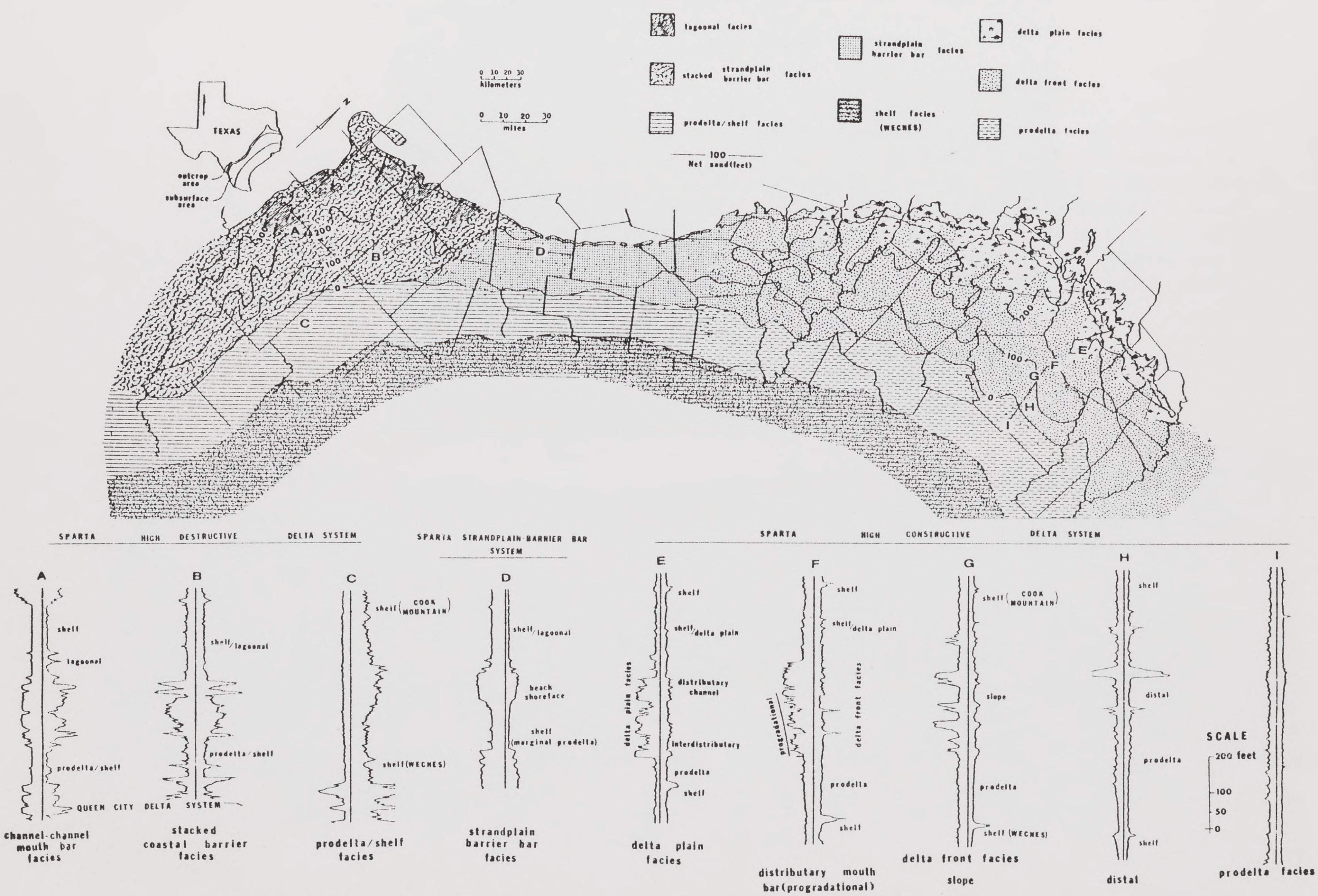

Figure 18. Well logs of representative facies, Sparta depositional systems.

Figure 19. Abrupt vertical transition from the basal highly fossiliferous, glauconitic shelf mudstone of the Weches Formation to the basal delta-front facies (channel-mouth bar) of the Sparta high-constructive delta system, east Texas. U.S. Highway 69, five to seven miles north of Jacksonville, Texas.

Figure 20. Progradational sequence (delta-front facies) in the Sparta high-constructive delta system in east Texas. Deformed basal mudstone (load structures) overlain by horizontally interbedded silty and sandy layers. These sediments are composed of bidirectional, small-scale, tabular cross-beds, and become sandier upward with corresponding increase in abundance and scale of cross-stratification. Seven miles southeast of Jacksonville, Texas on U.S. Highway 69.

Figure 21. Channel-mouth bar highly reworked by wave processes, and characterized by laterally persistent, well-sorted, fine grained sandstone. Sandstone facies exhibit accretionary, low-angle cross-stratification composed of small-scale foreset cross-beds. Sandstone abruptly overlies prodelta mudstone deposits. Sparta high-constructive delta system, east Texas. U. S. Highway 69, two miles northwest of Rusk, Texas.

Figure 22. Distributary channel-fill (delta plain facies) composed of fine-grained sandstone with abundant mud clasts, and abundant medium to large-scale, trough-filled cross-beds in its central part (right side of the picture. Cross-bedding decreases in scale toward the channel margins where ripple-drift cross stratification becomes dominant. Sparta high-constructive delta system, east Texas. Farm Road 39, one-half mile south of Flynn, Texas.

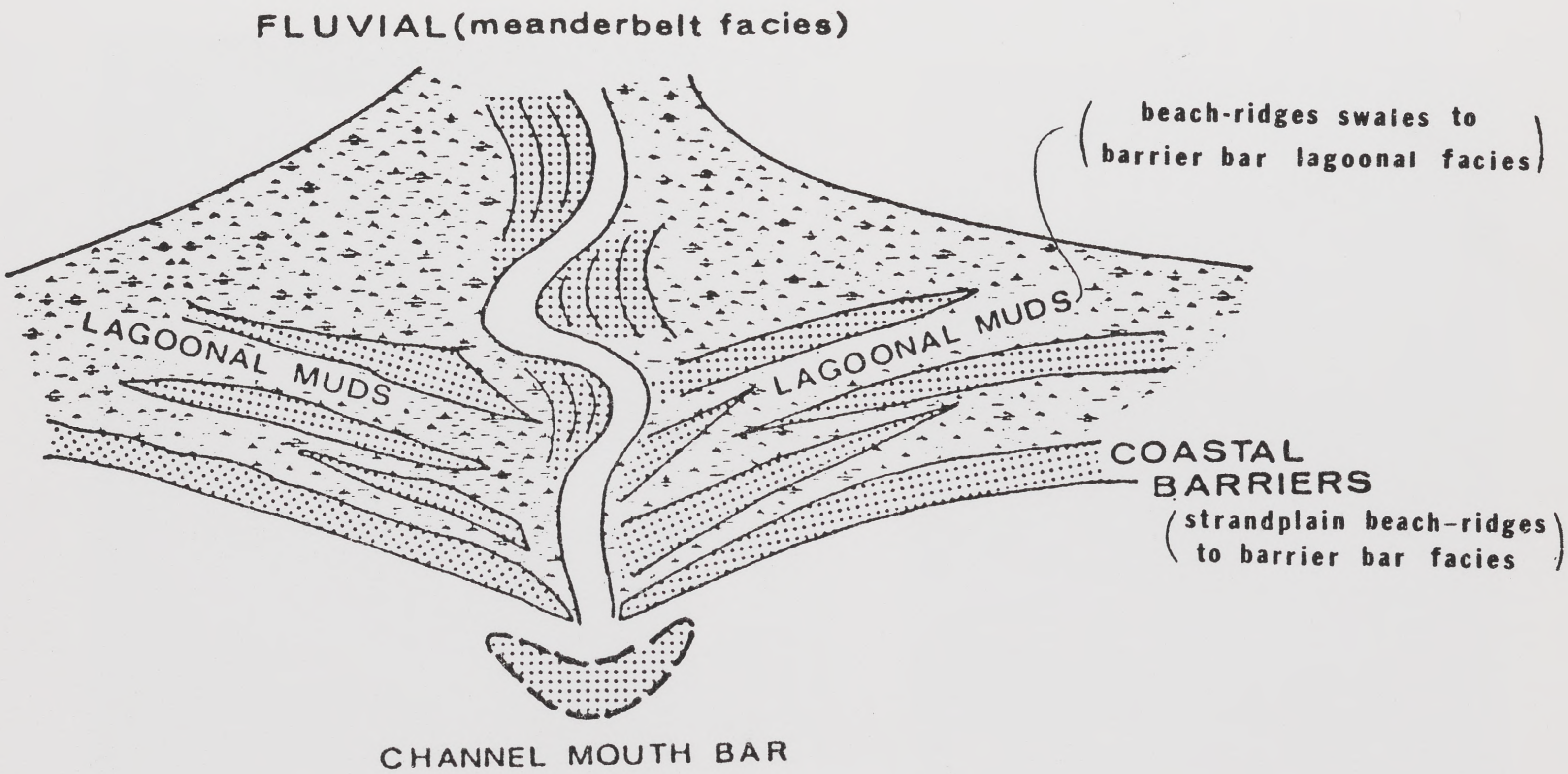

Figure 23. High destructive cuspate (wave-dominated) delta system showing strike-oriented coastal barrier facies, and associated narrow lagoonal mud facies (from Garcia, 1972).

Figure 24. Lagoonal deposits composed of interbedded sandstone, siltstone, mudstone, and gypsum lamination. Some sandy beds show ripple cross-stratification, and other beds are highly bioturbated. Shell concentrations form calcareous concretions (fig. 25). These dark lagoonal deposits abruptly overlie sandier beach-shoreface deposits. Sparta high-destructive, wave-dominated delta system, south Texas. On Texas Highway 44, five miles west of Encinal, Texas.

Figure 25. Calcareous concretions characterized by many molluscs shells and burrows. Concretions are distributed within lagoonal facies (see fig. 24). Sparta high-destructive delta system, south Texas. On Texas Highway 44, five miles west of Encinal, Texas.

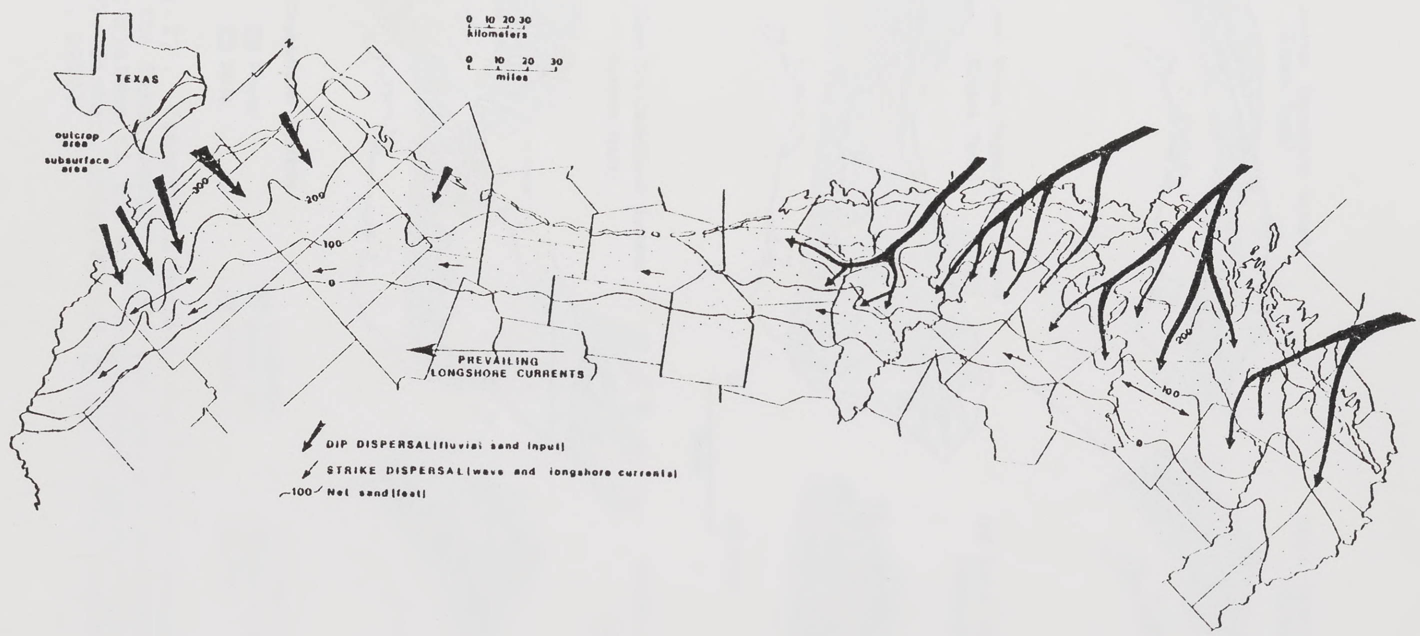

Figure 26. Sediment dispersal map, Sparta Formation, Texas Gulf Coast basin.

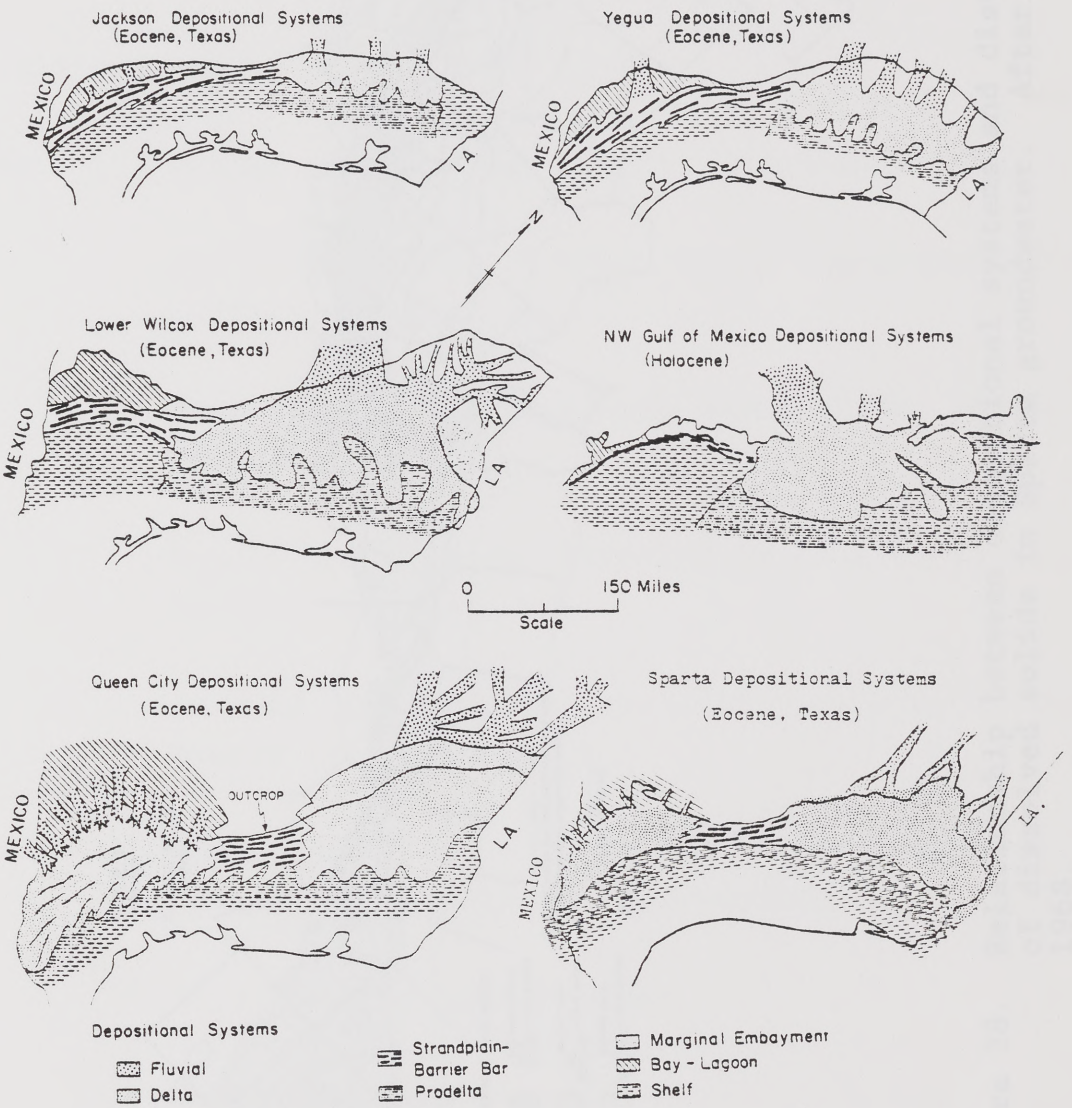

Fig. 27 . Comparison between the Sparta depositional systems of the Texas Coastal Plain and ancient and modern depositional systems of the Gulf Coast Basin (after Fisher and McGowen, 1967; Fisher, 1969; Fisher <u>et al</u>., 1970; Guevara, 1972; Garcia, 1972).

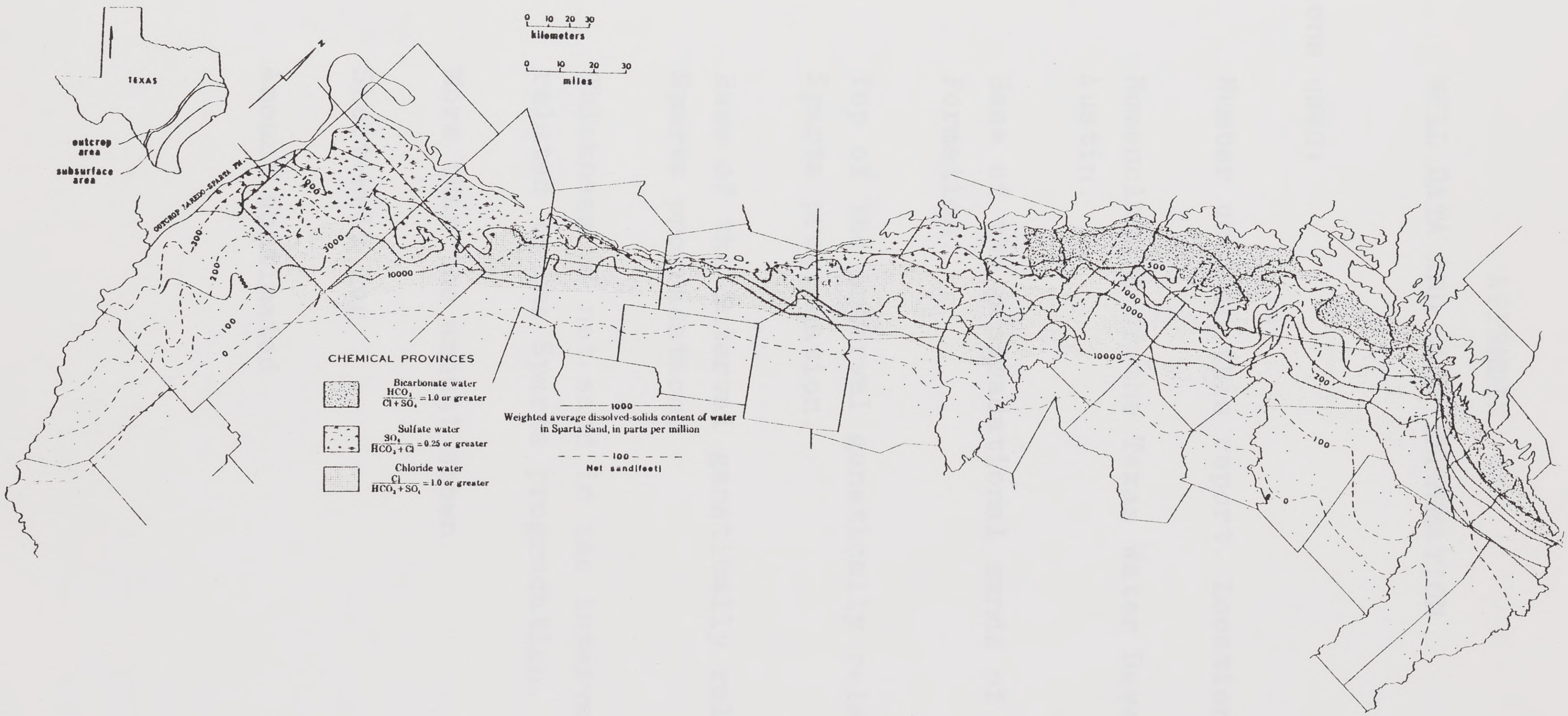

Figure 28. Relationship between depositional systems and distribution of dissolved solids in Sparta groundwater. After Payne, 1968.

APPENDIX

WELL DATA AND SAND INFORMATION

Abbreviations used:

Well No.	Number used in this report. Location on fig. 1
Q	Nomenclature of the Texas Water Development Board, Austin.
By	Base of the progradational sands of the Yegua Formation.
Ti	Top of the interval genetically related to the Sparta progradation.
Bi	Base of the interval genetically related to the Sparta progradation.
Sd	Thickness of net sand in the interval genetically related to the Sparta progradation.
100 +	More than the amount shown
(100)	Short well log
100 E	Amount eastimated

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
			ANGELINA COUNTY				
1	53	Sam Trant *et al.*	Mc. Knight # 1	- --	(90)	370	230+
2	57	D.A. Byrd.	Angelina County Lbr.	- -	180	515	280
3	54	Coastal Refg. Co.	Henderson 1	250	350	750	210
4	55	Am. Lib. Oil Co. Webb & Knapp	Cameron Heirs 1-B	- -	(100)	300	85+
5	59	J.R. Mecker *et al.*	John Massingill 1	520	780	1230	205
6	2	J.W. Frazier	Angelina Lbr. 1	650	975	1380	235
7	49	B.G. Bgars & E.L. Kurth	Southern Pine Lbr. Co. # 1	640	950	1365	170
8	50	B.G. Byars & E.L. Kurth	Argentina County Lumber Co. # 2	790	1070	1530	210
9	67	E.L. Kurth	Koppers Co. 1	870	1160	1590	170
10	65	Trns- Am. Petr. Co.	Roy Hambrick 1	950	1300	1710	180
11	4	K.L. Mc Henry *et al.*	Souther Pine Lbr. 1	1070	1390	1825	195
12	60	Mc Donald Oil Corp.	Stewart # 1		1000	1400	165
13	52	C. Andrade III	Otis Nerrin 1	1160	1485	1880	160
14	39	K.L. Mc Henry	Long Bell 1	840	1160	1520	165
15	51	Tex -Mo Drlg. Co.	Long Bell Petr. Co.1	1280	1640	2050	120
16	3	ArKansas fuel oil Co.	The Carter Co. 1	1400	1775	2240	200
17	5	K.L. McHenry	Wm Cameron Co. 1	1810	2090	2525	110
18	7	Petr. Heat & Power Co.	Southern Pine Lumber Co. 1	1330	1495	1854	170
19	12	Mudge oil Co. & K.L. McHenry	Fairchild *et al.* 1	1510	1850	2320	155
20	38	Union Producing Co.	Fenley 1		(132)	400	150+
21	58	Humble oil & Refg.Co.	Angelina Country Lbr. Co. et al. 1		450	815	225
22	78	Placid oil Co.	Fairchild # 1	355	470	860	210
23	76	Humble oil & Refg --- Co.	Angelina County Lumer Co.# B-2	- -	500	854	200
24	72	E.L. Kurth	L. Henderson # 1		250	700	200
25	70	E.L. Kurth Trustee	Angelina County Lumber Co. # 8	1165	1200	1655	185
26	91	Herty Water Co.	Water Well 10	560	600	840	140
27	86	Key Drlg. Co.	M & M Water Supply 1	150	200	600	150
28	25	Texas Water wells, Inc.	City of Lufkin 8	200	310	650	200
29	81	Katy Orlg. Inc.	City of Lufkin 10	310	390	750	200

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
30	104	Layne Texas Co.	Owens Illinoios Co. 1	500	620	990	170
31	105	Temple Industries, Inc.	Southland paper Milles *et al* 1	820	220	1285	170
32	6	K.L. McHenry	Humble Fee 1	1425	1775	2190	125
33	37	J.W. Seward *et al*;	L.T. Dearman 1	1590	1900	2350	135
		AUSTIN COUNTY					
1	94	Dillard & Waltermire	Batla 1	5520	6175	6650	0
2	88	The Texas Co.	Kollatschng 1	5865	6570	7080	0
3	82	Skelly oil Co.	Zander 1	5540	6200	6700	30
4	29	Scurlock oil Co.	Kulow-Bielefeld Unit 1	6290	6880	7725	0
5	103	The Texas Co.	H.W. Hack field 1	4120	4550	5000	105
6	115	Holmes Drlg. Co. & Robert Musbacher	Wriht # 1	5190	5560	6080	100
7	126	Humble oil Refg. Co.	Max Bader # 1	5660	6350	6820	20
8	24	Phillips Petr. Co.	Shulltz # 2	3840	4160	4600	125
9	60	John G. Mayo	Boliman 1	4800	5220	5700	50
10	23	Humble oil Refg. Co,	L.R. sherrod Y-16	4800	5600	6150	10
11	17	H.E. Williams *et al*.	Mewis 1	5700	6400	6940	5
12	3	Sun oil Co.	Hikeska 1	4970	5550	6080	35
13	93	Butcher-Arthur, Mc	Walter Schneider 1	5560	6350	6800	20
14	72	Humble oil & Refg. Co.	Hedwing Miller 1	4510	4880	5350	70
15	71	Pure Oil Co.	Stepan 1	4480	4890	5360	125
16	63	New Ulm corporation	Peschel 1	4805	5410	5905	40
17	21	Sinclair Prairie oil Co.	W.A. Schwske 1	4910	5520	5980	20
18	66	Sinclair oil & Gas Co.	Ballard Unit 2	4980	5520	5960	30
19	22	Pan Am. Prod. Co.	Austin College 1	5865	6550	6950	5
20	91	Union Prod. Co.	Brine # 1 (Unit 3)	6320	- -	- -	0
21	69	oil Drlg. Inc	D.L. Mart el al # 1	5180	5750	6200	15
		ATASCOSA COUNTY					
1	147	Humble Oil and Refin ing Co.	S.P.J. ST. Louge	- -	170	370	120
2	131	Humble Oil and Refin ing Co.	Henry Schorsch No.2	- -	190	410	120
3	281	The Layne Texas Co.	Lower Nueces River water Supply district W.W. # 7	1060	1510	1750	85

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
4	52	Farenthold and Pilcorin and Minton	Harris No. 1	550	850	1055	100
5	63	Sun Oil Co.	A.M. Peeler No. 1	770	1100	1320	110
6	204	S.F. Hurlent	H.D. Countiss No.1-A	510	850	1070	115
7	6	Dow B. Megahan	Donna Farms No. 2	1040	1465	1720	110
8	252	Caroline Hunt Trust Estate	Felix Frenzel No. 1	1950	2400	2650	50
9	228	Tri-Mark and Texita oil Co.	Zoe Kiwilliams No. 1	650	1030	1260	100
10	219	Newan Bros etal.	Priesen Hahn No. 1	800	1160	1360	85
11	236	F. William Carr	Lytletom No. 2	1890	2415	2650	40
12	102	Calvin Michelson	Minnie Lee Tom No.2	1920	2050	2290	90
13	7	Southern Minerals Corp.	Mattie Carbitt No. 1	1370	1630	1810	80
14	209	M.G. Perry	R.L. Eschenberg No.1	1300	1720	1940	65
15	142	Sun Oil Co.	Rugh Hagan Unit No.1	650	965	1175	125
16	367	General Crude oil Co.	Esther No. 1	- -	350	550	120
17	26	Magnolia Petroleum Co.	E.A. Kinseel No. 1	950	1250	1460	95
18	207	Southern Minerals Corp.	J.L. Tom 1	1720	2240	2475	50
19	245	H.R. Smith, et al	Smith & Mowinckle 1	1690	2190	2430	55
20	369	Milam Drilling Co.	Milton Davis No. 1	- -	- -	455	100
21	280	Mckinley Drilling CO.	Linkenhoger No. 2	120	385	655	145
22	231	Ray McDonald and H. S. Drilling Co.	L.C. Berry No. 2	380	580	850	140
23	344	Forney and Winn Co.	Allenhime No. 1	- -	260	515	150
24	270	Sidkatz et al.	C.T. Troell No. 6	290	535	745	115
25	234	Mergan Minerals et al.	M.T. Tlalnagan No.1	400	750	1050	140
26	194	Humble oil and Refining Co.	Duren and Richter No. 1	- -	360	610	130
		BASTROP COUNTY					
1	2	Continental Oil Co.	Mallina 1	190	500	620	85
2	22	The Texas Co.	Cone Hole A-15	--	--	110	50 +
3	82	Thos. Jordan, Inc.	Grubert 1	--	200	390	90

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
			BEE COUNTY				
1	328	Stanolind Oil and Gas Co.	M.S. Gould No. 1	3370	4100	4330	0
2	124	Hewit and Dougherty	Cleo Dubose No. 1	3100	3820	4110	0
3	195	Shell Oil Co.	Juan Alvarado et al. No. 1	3600	4320	4690	0
4	179	Seaboard Oil Co.	H.H. Striebeck No.1	3490	4215	4550	0
5	330	Luling Oil & Gas Co.	W.E. Ruckman 1	3610	4215	4480	5
6	140	Shell Oil Co.	Alvin L. O'Neal 1	3430	4200	4450	0
			BRAZOS COUNTY				
1	15	Humble oil & Refg. Co.	Trant- 1	- -	1420	1815	210
2	13	Petr. Heat & Power Co.	Cahill 1	1620	1800	2280	210
3	21	Phillips Petr. Co.	Weems- 1	1670	1950	2440	190
4	19	Lonnie Holotik	Prescott 1	1740	2070	2600	150
5	1	Southwood oil Co.	E.U. Peters 1	760	875	1300	190
6	29	J. Eller Thomas	Milo Heirs- 1	2312	2550	3000	150
7	20	N.W. Unter	Jericho 1	1910	2315	2850	190
8	27	Mudge oil Co.	Koppe 1	280	415	785	215
9	33	Fred W. Shield	Louis Orland Estate # 2	2305	2635	3140	165
10	6	Katy Drlg. Co.	A & M College 6	- --	120	540	180
11	4	Texas A & M College	Siegert 50 Acre Tract Test No. 1	80	180	575	200
12	25	Phillips Petr. Co.	Shoeps 3	1820	2240	2600	180
13	12	The Layne Texas Co.	Test w.11 # 4	105	340	740	170
14	58	Michael A. Salvato	C.S. Beckwith # 1	510	760	1140	160
15	34	A.E. Burgin et al.	N.A. Stewart 1	910	1050	1425	180
			BURLESON COUNTY				
1	7	Haven Oil Co.	Lewis est. # 1	1135	1260	1630	200
2	6	Peerles Oil & Gas	E.J.Engle # 2	1500	1625	2050	185
3	9	Chas Fraser, Inc.	MareK 1	700	820	1165	200
4	10	Newman Brothers Drlg. Co.	John E. Newman 2	720	840	1185	200
5	11	H. Y. Barne H	Fick 2	850	940	1350	240
6	26	Key Drlg.Co.	Deanville Water Supply Corp # 1	- -	215	420	150
7	36	Hammam Oil Co.	Worthing		(200)	335	100+

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
		CHEROKEE COUNTY					
1	77	City of Walls	B.E. Lee 100A	- -	75	450	200
2	212	Delta-J.W. McFarlane	Warner 1		200	370	130+
		COLORADO COUNTY					
1	231	Sinclair Prairie Oil Co.	Gordon 1	4910	5330	5780	40
2	76	H.B. Lively	Brune 1	4750	5215	5670	10
3	144	C. Howard Phifer	Wooten 3	5205	5830	6320	0
4	222	Sinclair Prairie Oil Co.	Thompson-1	4825	5335	5800	30
5	220	Midstates Oil Corp.	Suchadoll Unit No. 1	4770	5300	5740	25
6	281	Sinclair Prairie Oil Co.	Koliman 1	4820	5225	5685	40
7	232	Sinclair Prairie Oil Co.	Glasscock-2	5220	5880	6340	0
8	249	Skelly Oil Co.	Miller- 1	4900	5300	5740	0
9	133	Oatman Oil Inc.	Strunk & Kobel-1	4600	5000	5420	0
10	162	British American Oil Peod. Co.	Roensch- 1		7450	- -	0
11	248	Sinclair Prairie Oil Co.	Fehrenkamp	5849	6450	7000	0
12	286	Union Prod. Co.	Thomas-A-1	6920	7620	8070	0
13	183	Cities Service oil Co.	Brune 1	4840	5300	5760	5
14	85	Carthay Land Co.	Edgar Heinsohn et al. 2	4870	5360	5820	3
15	253	Cities Service Oil Co.	Everett 1	6120	6800	7260	0
16	178	Tex. Coast Co.	Glasscokk 2-A	5260	6390	- -	0
17	60	Delhi-Taylor Oil Corp.	L.B. Jenkins 1	5480	- -	- -	0
		DEWITT COUNTY					
1	93	Rowan and Hope and Ranger and Burson	J.C. Naulis No. 1	3300	4040	4280	0
2	126	Coestal States Gas Producing Co.	Georgia Du Bose - et al No. 1	2970	3130	3380	0
3	226	Pitkin and Goldston	Hilda Mugge # 1	4080	4800	5040	5
4	44	Kirwood Drilling Co.	Otto Roehml No. 1	4350	5020	5260	0
5	48	Lamar. Hunt Trust State	Otto Roth camp No.1	4120	4610	4890	0
6	50	Glen A. Martin and the Schodfield Corporation	Seiffer No. 1	3050	3570	3840	20
7	225	Sterling Oil and Gas Co. and M.E. Fox Traustee	Hamilton No. 1	4445	5180	5380	0
8	200	International Petroleum Corp.	Harbuck Unit No.1	4360	5090	5320	0
9	80	G.H. Vougmn Production Co.	M.L. Milgarther - No. 1	4480	5170	5400	0

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
		DUVAL COUNTY					
1	175	Humble Oil & Refining Co.	James F. Welder, Heirs No. B-1	4500	5290	5620	0
2	481	Jare Hamon	Pedro Leal No. 1	4260	5130	5530	0
3	645	Bridwell Oil Co.	G. A. Taft No. 3	4080	4800	5170	0
4	67	Atlantic Refining Co.	Hagist Ranch No. 1	3700	4450	4780	0
5	1313	Delhi Oil Co.	Hagist No. 1	3780	4135	4490	0
6	1314	Delhi Oil Co.	San Juan Drilling Co. No. 2	4100	4740	5130	0
7	1392	Magnolia Petroleum Co.	Duval Co. Ranch No. 1	3135	3675	4025	10
8	1603	J.W. Morgan et al	H.S. White Cotton 1	3140	3680	4000	20

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
		FAYETTE COUNTY					
1	106	Shell Oil Co.	Marburger 1		170	430	80
2	102	H. F. Brown Jr, Sunray D-X Oil Co. & Stapp Drlg. Co.	Wehmeyer et al. -1	2010	2200	2400	80
3	98	Parker McFarland & Monsanto Che. Co.	Styrk - 1	2470	2790	3125	110
4	92	Gulf Shore Oil Co.	Kremel - 1	120	335	550	100
5	86	M. E. Davis	Janda - 1	2650	2960	3340	125
6	44	Gulf Coast Lease Holds Inc. & J.D. Watzlavick	Vogelsang - 1	2460	2800	3085	105
7	42	O. C. Corvey	Meyer et al. - 1	3675	3900	4240	110
8	35	M.M. Miller	Cole et al. - 1	1660	1980	2300	115
9	31	Fidelity Oil Royalty Co.	Wegenhoft - 1	3310	3680	4040	90
10	29	C. Andrade II & J. R. Less	Eichier - 1	2780	2950	3310	200
11	23	Seaboard Oil Co.& St. Oil Co. of Kansas	Pietsch - 1	1720	1890	2220	210
12	20	W. J. Rasnick	Krakosky - 1	930	1100	1390	215
13	18	T. Wilson	Leview - 1	2610	2770	3140	235
14	8	Hamman Oil & Refg. Co. & J.Crawford	Harris - 1	650	830	1080	150
15	89	Benedum & Trees et al	Ray Musli - 1	3535	3920	4200	40
16	13	Traders Oil Co. & E. H. Phillips	Fleck - 1	850	980	1325	125

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
17	33	American Liberty Oil Co.	Baca 1	2600	2730	3120	115
18	28	American Liberty Oil Co.	Schlottman 1	2530	2710	3040	160
19	82	Continental Oil Co.	Louise Paulus 1	730	1050	1310	120
20	100	H. E. Burkart	Mary A. Broain 1	2130	2590	2875	105
21	85	Coastal Refg. Inc. & C.D. Miller	Faison 1	420	610	950	130
22	67	Cockburn Oil Corp.	Gebhard 1	2940	3140	3500	215
23	17	J. W. Frazier	Zock 1	825	960	1290	210
24	90	Kennescott Cooper Corp.	Schwartz 1	1990	2150	2490	135
25	122	J. S. Michael Co.	Kerr Johnson *et al*. 1	960	1250	1545	125
26	39	Sutton Drlg. Co.	Leon Mirales 1	1050	1300	1650	115

FRIO COUNTY

1	179	kirkwood and Morgan	Cox No. 1		50E	450	350E
2	7	Producers Corporation of Nevada	Irma Mills No. 1		(107)	275	120 +
3	47	Humble Oil and Refining Co.	F.C. McKinney No. 1		(85)	270	130 +
4	13	Schimel Drilling Co.	Oppenheimer and Lamb No. 1		(245)	400	155 +
5	19	Louis H.Harring Jr.	E.B. Simmons Jr No. 1	320	520	740	125

GONZALEZ COUNTY

1	100	C.C. Winn	T.D. Monford No. 1	490	590	810	35
2	51	Newman Bros American A.S. Billings # 1	Republics et al	1175	1310	1540	60
3	121	Owen & Beauchamp	Frnk Kunetka 1	1660	1810	2020	30
4	142	L.G. Shell and W.L. Dugger, Jr.	Pearl Young No. 1	1630	1740	1960	75
5	166	Tenneco Oil Co.	Frank Ullman No. 1	2575	2750	2940	25
6	33	Kirkwood & Co. et al	Weber 1	- --	610	820	70
7	84	Karkins and Co.	Zappe No. 1	2140	2650	2870	75
8	60	Corder Drilling Co.	J.S. Lewis No. 1	- -	470	620	80
9	63	Ada Oil Co.	Katie Batery No. 1	1250	1365	1580	65
10	66	H.L. Hunt	W.R. Miller No. 1	2390	2890	3100	25
11	69	Cecil V. Hagen	Heinemeyer No. 1	870	280	1200	80
12	147	J. E. Hillier	Oscar Baker 1	1000	1100	1320	80

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
		GONZALES COUNTY					
13	4	J.W. Gorman	Parr 2		100	330	120
14	43	Texon Rox Co & Auto-Ordenance Corp.	Kelley 1	1500	1920	2180	85
15	28	The Chicago Corp.	Bokhm 1	1700	2040	2300	100
16	10	O. Neathery, Jr.	Balbridge 1		(420)	620	100 +
17	57	Corter Foundation Prod. Co.	Brubaker 1		(1000)	1200	100 +
18	128	Kirkwood & Co.	Wright 1	850	1000	1285	95
19	86	Rodrey Delange	Burkhalter 1	1265	1490	1870	90
		GRIMES COUNTY					
1	3	J.M. West	Garret 2	600	710	1130	250
2	4	James A. Smith	W.A. Isbell 1	840	1150	1550	210
3	6	J.H. Woodard, Jr.	Upchuruch 1	1210	1500	1920	220
4	5	Woodley Petr. Co & Signal oil & Gas Co.	Mattic F. Wilson 1	2200	2510	2970	180
5	19	E.G. Gofoth <u>et</u> <u>al</u>.	Gaforth fee 1	5620	6170	6730	10
6	27	Placid oil Co.	Harris 1	4970	5550	6025	70
7	8	R.N. Ranger & R.L. Kikwood	I.P. Bradley 1	3050	3470	3940	160
8	17	Shell oil Co.	Flora I. Johnson 2	670	1050	1380	185
9	28	Hunt oil Co.	Yeager 1	640	790	1170	260
10	30	The Texas Company	N.E. Moody 1	2115	2550	2955	150
11	36	Humble oil & Refg. Co.	George Sealy 1	1890	2130	2620	180
12	37	Moore & Ahrn	Bennet 1	3550	3910	4420	150
13	42	Irwing et al South Tex Dev.	Schoenfeldt 1	5920	6490	6770	10
14	9	Laird-Baker & Young	Neeley 1	910	1010	1420	220
15	59	Placid oil Co. <u>et</u> - <u>al</u>.	R.O. Davis Jr # 1	3790	4285	4700	160
16	63	Placid oil Co. <u>et</u> - <u>al</u>.	Robert Boster 1	3830	4210	4600	150
		HOUSTON COUNTY					
1	1	Reynolds Mining Corp.	Knox 1	660	750	1190	270
2	11	Woodley Petr. Co.	Bruton Est. 1	405	550	965	230
3	20	Humble oil & Refg Co.	Curry-1	600	740	1050	260
4	31	Continental oil Co.	Wooters 1	590	690	1060	170

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
5	181	Humble oil & Refg. Co.	C.W. Legory 1	---	(450)	620	120+
6	64	Marine Gathering Co.	Merriwether 1	- -	400	740	215
7	65	Frankel & English	Houston County Timber Co. 1	- -	500	865	280
8	61	Cherry & Kidd	Moore 1	- -	(326)	435	80+
9	92	F.T. Lytle	Watson Heirs 1	1090	1190	1580	210
10	52	Coastal Refineries Inc	Southern Pine lbr. Co. 1	- -	280	600	240
11	66	M.W. Shriver	Wayman & Bromberg 1	- -	425	830	360
12	70	Magnolia Petr. Co.	A.B. Spence 1	- -	350	700	235
13	144	Chism & Porter	Austin 1	275	340	680	240
14	264	Humble oil & Refg. Co.	Stevens 1	1370	1500	1900	175
15	233	George D. Blaylock	Southland Paper Mills 1	1110	1270	1710	195
16	107	R.M. Sims	Walker & Harris 1	---	(310)	420	100+
17	.27	Ivy & Murray	Murray & Sons 1	330	450	850	215
18	21	Coats Drlg. Co.	J.C. Yarborough 1	- -	420	850	300
19	94	The Pure oil Co.	H.N. Wright 1	720	810	1240	220
20	756	Texas Gen. Prod. Co.	Bromberg English 1	---	510	720	120

JASPER COUNTY

1	22	Humble oil & Refg Co.	Nona Mills et al. 1	2335	2600	3140	140
2	94	Atlantic Richfield Co.	D.M. Henderson et al. 1	2980	3320	3750	100
3	80	Marathon oil Co.	Jasper County Lumber Co. # 1	4500	4860	5375	70
4	5	Mayo & Chapman	Cartwright # 1	5720	6370	6890	0
5	42	The Texas Co.	Champion Paper & Fiber Co. # 1	6900	7560	8080	0
6	45	The Atlantic Ref.Co. & Sinclair oil & Gas.	H. & T.C. Sect. 65 # 1	7280	7900	8580	0
7	79	Franck Buttran	Gilbert Est. 1	4230	4550	4990	80

JIM HOGG COUNTY

1	66	Austral Oil Company and the atlantic -- Refining Co.	Marrs Mclean No. 2	- -	4985	5550	0
2	79	Jake L. Hamon	Francisco E. Perez No. 1		4990	5490	0

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
		KARNES COUNTY					
1	20	Texita Oil Co. & Harris D. Jaffe	A.J. Luckett Est. No. 1	1610	1860	2065	80
2	6	Martin Shelly & Thomas	Alex Pahalek No. 1	610	1060	1310	80
3	415	Sun Oil Co.	Geo.B.Wells No.1		900	1120	80
4	162	Montego Oil	Cochran No. 1	2290	2420	2640	60
5	219	Federal Royalty Co. & Rio Grande Drilling Co.	Mary Yanta No. 1	2510	2970	3255	40
6	107	Standard Oil Co. of Texas	C.W. Rzeppa No. 1	1870	2330	2600	75
7	131	John J. Goyle	Ernest Esse No. 1	3140	3710	3960	10
8	40	Kirkwood & Morgan Inc.	James Nichols 1	1800	2040	2310	55
9	66	Rowan & Hope	Paul Banduch 1	2520	3000	3300	35
10	85	Humble Oil & Refining Co.	M. N. Butler No. 2	2270	2840	3110	45
11	215	Southern Minerals Corp.	Bryan Campbell No. 2	1560	1800	2020	70
12	268	R. W. Ford & Crown Central	Ed. Endrusch 1	1415	1860	2070	75
13	128	Phillips Petroleum Co & Sohio Petroleum Co.	G. T. Beahan No. 2	4050	4800	5070	0
14	130	Ernest Fletcher	Annie Zamzow No. 1	3165	3720	3965	15
15	367	H. R. Smith & O. C. Mc.Bride, Inc.	Jake Jarmon No. 1	3400	4045	4300	15
16	267	Southwood Oil Co.	Cannon Est. No. 1	2790	3320	3550	25
17	97	Southern Minerals Corp.	Alice Ryan No. 1	2270	2765	3010	55
18	90	Brazos Oil & Gas Co.	Otha Person No. 5		2240	2500	80
19	133	Producers Corp. of Nevada & Cosden Petroleum Corp.	W. S. Cochran, Jr. No. 1	1010	1490	1710	65
20	411	Union Producing Co.	M. Schaefer No. 1	3390	4090	4330	0
21	55	Shell Oil Co.	Charles G. Kainer No. 1	1900	2010	2260	90
22	401	Earl Callaway Drilling Co.	Debord No. 1	3500	4170	4390	15
23	463	Sun Oil Co.	Short Gas Unit No. 1	3930	4635	4790	0
24	494	Seaboard Oil Co.	Mrs. C. F. Barlow No. 1	470	890	1100	80
25	269	Seaboard Oil Co.	E. Plueckhahn No. 2	2180	2630	2900	50
26	57	Shell Oil Co.	E. F. Hartman No. 1	2510	2670	2915	50
27	220	Sunray Oil Co.	H. A. Discher No. 1	4110	4960	3150	0

Well No.		Company	Well Name	By	Ti	Bi	Sd
28	180	Continental Oil Co.	W. E. Kisnear 1	4575	5290	5570	0
29	179	Blanco Oil & Al Buchanan	Clara P. Nichols 1	3650	4300	4600	0
30	134	Tennessee Prod. Co.	Paul Seidol 1	2620	3150	3390	35

LA SALLE COUNTY

1	85	Engeo Oil & Gas Co. & Sam Larve *et al*.	Margaret Kimball 1	630	690	990	165
2	39	Kirkwood & Morgan, Inc.	Nagy No. 1		(100)	530	250 +
3	71	Sutten Producing Co.	Ben Alexander No.1		(150)	355	100 +
4	20	L. V. Chenoweth	Fee No. 1	500	680	960	150 +
5	52	Quintana Petroleum Corp.	R. W. Kostroun No. 1	780	870	1120	140
6	49	Appel Petr. Corp.	Naylor & Jones Ranch Co. *et al* 1	1050	1180	1420	135
7	12	H. R. Cullen	D. Widenthal 1		(100)	560	265 +
8	32	Sutton Producing Co. & O. W. McCurdy	W. E. Pfluger No. 1	830	935	1270	205
9	2	Navarro Oil Co.	Ray L. Talbort No. 1	1100	1190	1470	195
10	86	Skinner & Eddy & Newman Brothers	So. Texas Syndicate No. C-4	1380	1720	1930	115
11	53	Sutton Production Co.	C. N. Cooke No. 2 - A	510	730	1030	200
12	59	Fred W. Shield Navillus Oil Well Serving Co.	Sam Evans No. 1	460	690	970	280
13	54	R. N. Ranger	Jeffries Ranch No. 1		835	1190	210
14	76	J. E. Aillier	R. J. Nunley No. 1	1000	1355	1600	210
15	68	Frank Kallina & Ralph Evans	Cartwright B-1	910	1010	1310	200
16	42	Sutton Co.	Preston Stone No. 1	850	1060	1370	200
17	72	Jack Frost	South Texas Sindicate No. 1	1310	1490	1700	130
18	51	Appel Petroleum Corp.	Naylor & Jones Ranch Co. *et al*. No. 2	900	1055	1235	180
19	155	Seaboard Oil Co.	Nueces Land & Live Stock Co. # 1	1870	2050	2300	95
20	29	Kirkwood & Morgan & C. C. Winn	Mathilde Olla *et al*.	510	590	990	175
21	164	Walter H. Mengden *et al*.	Alice Burkholder "B" No. 1	280	380	740	265
22	75	Sohio Petroleum Co.	Callaghan Land & Cattle Co. No. B-1	1070	1280	1610	210
23	56	Henderson Coquat & Amerada Petroleum Co.	St. Louis Union Trust Co. No. 1	1650	2090	2310	130
24	134	Newman Bros. & Alaska Steamship Co.	South Texas Syndicate No. F-3	1525	1700	1900	110
25	147	O. W. Killam	L. Otis Cox No. 1		(100)	530	170 +
26	158	Lann & McClannawan	Storey & Reed No. 1	350	425	775	210

Well No.	Q	Company	Well Name	Bv	Ti	Bi	Sd
27	99	Alaska Steamship Co.	South Texas Synd. D-3	1020	1340	1580	140
28	8	Quintana Petroleum Corp.	Naylor Jones No. 1	960	1090	1350	150
29	88	Skinner & Eddy & Newman Brothers	South Texas Syndicate No. F-1	1300	1530	1800	130
30	112	The Texas Co.	The La Salle Co. - No. 1	330	500	750	140
31	154	Hill Spice Miller & Pierce	Nueces Land & Livestock Co. No. 1	1580	1760	2000	110
32	163	Sutton Prod. Co.	South Texas Sindicate 1	1190	1310	1540	150
33	136	Sinther Warren & Sinther	A. Martin No. 1		425	650	170
34	156	Henderson Coquat	H. O. Storey No. 1		580	1000	210
35	187	Petroleum Inc.	St. Lous Union Trust Co. No. 1	1370	1500	1720	115

LA VACA COUNTY

Well No.	Q	Company	Well Name	Bv	Ti	Bi	Sd
1	23	Herton Oil Co.	Hohman 1	2720	3100	3405	60
2	149	Seabord Oil Co.	Emma Sebastian 1	3480	4000	4200	30
3	164	Geochemical Surv.	Jim Patek 1	3740	4150	4470	0
4	71	Sohio Petr. Co.	Ponisch 1	3820	4720	4620	5
5	148	Stanolind Oil & Gas Co.	Roeber et al. Gas Unit 1	3970	4400	4725	0
6	145	Adams & Haagarty	Sobotik 1	4030	4400	4750	0
7	165	Texas Eastern	Orsak 1	3880	4540	4900	0
8	121	Pure Oil Co.	Fred Schultz 1	4250	4900	5240	0
9	95	Pure Oil Co.	Peese Unit-1	4300	4900	5250	0
11	94	Roeser & Pendleton Inc.	Ponish 1	3830	4430	4970	5
12	137	Horrigan & Fohs	Martisak 1	4330	5000	5350	0
13	92	Navarro	Brown 1	2175	2500	2850	85
14	41	K. & H. Operating Co.	Andres Bludau	4110	4570	4950	0
15	68	Sohio Petr. Co. & Skelly Oil Co.	Paul Stock 1	3700	4245	4465	5
16	256	Houston Natural Gas Prod. Co.	A. J. Kubena 1	3690	4100	4430	5

LEE COUNTY

Well No.	Q	Company	Well Name	Bv	Ti	Bi	Sd
1	1	Union Prod. Co.	Preuss 1	380	630	915	140
2	59	A.A. Spidle	Ben Pietsch	1180	1260	1610	150
3	7	Seabord Oil Co.	Braman 1		500	660	110
4	29	Nails Creek Oil Co.	Seymour Sacks No. 1	470	640	880	130
5	44	W.H. Bode	Hill 1	280	1080	1380	115

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
			LIVE OAK COUNTY				
1	26	M.L. Massingill & Wilcox Oil Co.	D. Taylor No. 1	2040	2620	2850	30
2	294	Mills Bennet Est.	R. Thos, McDermott No. 1	2700	3320	3560	10
3	179	Stanolind Oil & Gas Co.	Alamo Lumber Co. No. 1	2920	3500	3780	15
4	297	Standard Oil Co. of Texas	J. V. Isaacks No. 1	2365	2970	3220	40
5	58	Seaboard Oil Co.	Gibbens No. 1	3000	3620	3900	0
6	67	Blanco Oil Co.	Clara Briam No. 1	4100	4975	5270	0
7	728	Richard E. Hass	M. M. Atkinson No. 1	4025	4835	5130	45
8	376	Henderson Coquat	C. Nelson Est. No. 1	4110	4940	5230	20
9	374	H. R. Smith & Gulf Oil Corp.	J. M. Powder No.1	2020	2610	2870	40
10	355	Argo Oil Corp.	Schreiner No. 1	3670	4440	4690	0
11	466	Sam E. Wilson	Grant Southorn Life Insurance 1	3230	3880	4180	0
12	375	Ryan Hays & Burne	Stolte No. 1	4510	5410	5690	30
13	182	Tenneco Oil Co.	Alamo Lumber Co. No. 1	2980	3575	3840	10
14	404	Magnolia Petroleum Co.	C.K. Maley No. 1	3980	4780	5020	0
			MADISON COUNTY				
1	37	Standard Oil Co.	Winnie High Tower		500	810	170
2	34	Cico Oil & Gas Co.	Fergusson C.D. 1		510	850	210
3	10	Woodley Petr.Co.	Hoyes 1	310	510	840	200
4	9	Woodley Petr. Co.	Forrest 1	410	600	950	215
5	6	Woodley Petr.Co.	Fanning Cannon Unit1	510	700	1100	270
6	8	Woodley Petr.Co & Signal Oil & Gas Co.	Mattie Mc. Whorter	510	650	1050	250
7	2	Merrit Oil Co.	Gustavus 1		(240)	625	250+
8	17	J.B. Stoddard	Tinckle 1	450	640	980	200
9	25	Humble Oil & Refg. Co.	A.J. Harrison 1	425	620	940	180
10	44	Sun Oil Co.	Jas. A. Fannin 2	600	770	1100	160
11	47	Lem Dunn	Jackson 1	365	545	920	260
12	50	Pan American Co.	Chambless 1	- -	- -	1500	210+
13	53	Ralph A. Johnston	Crisham Unit 1	410	620	985	240
14	63	Lone Star Prod. Co.	Hill *et al.*	590	750	1140	230
15	68	J.M. West	Mc Maham 1	610	780	1150	230
16	71	British American Oil Prod. Co.	Wake field B-2		(420)	760	200+
17	5	J.R. Parten	Green Brier Ranch 1	210	360	725	220

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
			MCMULLEN COUNTY				
1	124	Hassie Hurt Trust	Adolph Poerich No. 1	1645	1800	2040	115
2	104	Rowen and Hope et al.	H.M. Roark No. 1	1080	1600	1815	115
3	116	Q.H. Hedge and J.C. Wynne	N.M.Roark No. 1	1250	1730	1980	80
4	118	Phillips Petroleum Co.	Mula No. 3	1400	1580	1790	125
5	146	Gilcrease Operating Co.	Alamo National Bank Trustee No. 1	1600	1770	2025	110
6	155	The Shamrock Oil and Gas Corp.	Alamo National Bank Trustee No. 1	1460	1640	1880	110
7	26	Quintana Petroleum Co.	Mula No. 3	2150	2340	2610	70
8	92	Humble Oil and Refining Co.	Lowis M. Gubbels No.10	1180	1510	1760	95
9	23	Gulf Oil Corp.	Nueces Land and Livestock No. 1	2600	3100	3410	30
10	141	W. Ridley Wheeler Est.	Rives Well No. 1	3180	3810	4070	10
11	225	The Estate of Edwin M. Jones	Shiver No. 1	3730	4375	4640	0
12	248	J.E. Movinckle et al. Trust	KuyKendall No. 1	1480	1660	1890	95
13	17	Santa Clara Oil Co.	U.M. Brown No. 1	1830	1980	2230	80
14	353	Afroma Oil and Gas Co. Inc.	M.A. Tyler No. 1	1180	1670	1920	90
15	344	Amerada Petroleum Corp.	Murray Holland No. 1	3850	4300	4600	0
16	20	Sunray Oil Corp.	J.A. Bracken No. 1	1610	2165	2440	75
17	284	Skinnerand Eddy Corp. and Drilling Co.	S. Texas Syndicate No. A-A-1	1750	1950	2160	75
18	404	Kirwood and Morgan	H.D. and Sam Countiss No. 1	1070	1200	1405	25
19	246	Quintana Petroleum Corp.	S. Texas Syndicale No. F-8	1340	1500	1710	125
20	69	Texas Eastern Transmission Corp. and Producers corp. of-Nevada	G.L. Hayes	1830	2020	2300	115
21	350	Motex Oil Co.	Nueces Land and Livestack No. 2	2675	3220	3490	35
22	14	Dee Davenport	Dolph # 1-A	3060	3670	3920	5
23	6	Holly Development Co. et al.	Hays Ezzell Ranch No. 1	2700	3290	3590	10
24	29	Forest Oil Corp. et al.	J.C. Dilworth No. 1	1330	1530	1785	80
25	96	Gulf Oil Corp.	H.B. Schiner Ranch 1	2780	3370	3630	10
26	106	Hassie Hunt Tr.	R.B. Lowe No. 1	1160	1310	1510	120

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
27	112	Jess McMell	Jess McMeal No. 2	910	1000	1230	115
28	139	Thomas Drilling Corp.	W.O. and L.T. Stevenson No. 1	2150	2760	3060	25
29	147	Shell Oil Co.	M. Franklin, Jr. No. 1	1030	1140	1350	110
30	243	Newman Bros and Jegins Oil and Alaska Steamship. Co.	Mavel Lowe Grimes No. 1	1600	2050	2300	60
31	95	Hamill and Smith	R.S. Franklin No. 1	1000	1150	1335	110
32	119	McMullen County	Tilden Water well 1	1470	2020	2305	105
33	166	Continental Oil Co.	Richard Horton 1	1500	2000	2290	85
34	378	Humble Oil & Refg. Co.	Louis M. Gubbels	1090	1565	1795	110
35	347	Southern Minerals Corp.	Nueces Land & Lives Tock Co. # 1-171	2680	3190	3480	30
36	162	Gilcrease Oil Co.	A. Buchanan 1	4400	5050	5360	0
37	260	Estate of Edwin M. Jones	H. Ezzell # C-6	3730	- -	- -	0
38	113	Maguirre & DelMar Drlg. Co.	Lena Franklin # 1	1170	1290	1510	130
39	3	Argo Oil Corp.	R.F. Bass, et al unit 1	4350	4990	5280	0
		MONTGOMERY COUNTY					
1	45	Superior Oil Co.	T.A. Mc. Whorter B-1	6620	- -	- -	0
2	139	Superior Oil Co.	Dean A- 1	6700	7380	7910	0
3	144	Superior Oil Co.	Harry Brown 1	6260	6910	7450	0
4	262	Robinson Oil Co.	L.M. Walker 1	4025	4310	4770	115
5	50	Geo. W. Strake	J.P. Peel # 1	5200	5750	6260	15
6	135	Superior Oil Co.	Frost # 5	6570	7250	7780	0
7	280	Carvey at al	Hora 1	5115	5680	6170	20
8	285	The Texas Co.	Sealy Smith 1	5260	5800	6320	20
9	325	G.W. Strake	Jones et al 1	5340	5820	6400	10
10	326	Continental Oil Co.	Foster 1	5675	6250	6800	0
11	41	H.C. Cockburn et al	Foster Estate 2	5225	5565	6085	25
12	83	Donkin & Smith	Browder 1	5940	6510	7000	0
13	10	Donkin & Smith	Farrel 1	6120	6750	7300	0
14	35	Dick Schwab	Foster Estate 1	5910	6470	7000	0
		NACOGDOCHES COUNTY					
1	127	Layne Texas Co. Ltd.	Southland paper Mill carizo wilcox	- - -	(27)	370	180 +
2	7	Southland paper - - Mills Inc.	Angelina County Lumber Co. # 4	- -	(50)	320	150 +

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
		NEWTON COUNTY					
1	227	Cox & Hamon	Luther Moore Lbr. Co.1	3700	3990	4560	110
2	159	The Chicago Corp	Temple Lumber Co. 1	3760	4080	4650	120
3	220	Pan American Petr. corp.	E.W. Brown Jr. A # 1	4360	4700	5190	80
4	84	oil Reserves Corp.	Kirby-Winfrey # 6	6350	6925	7550	50
5	10	Humble oil & Refg Co.	W.W. Moore Jr. 1	6940	7565	8200	40
6	119	oil Reserves Corp.	Kirby-Pollard 1-K	6920	7470	8145	40
7	4	Humble oil & Refg Co.	E.P. Hughes # 1	7230	7660	8370	30
8	229	The Texas Co.	Sud-West, Jr. 1	7790	8450	9250	0
9	75	Gulf Oil Corp	Kirby Lbr. Co. A-1	7585	8250	9050	0
10	118	NorthCentral oil Co. & Ada Oil et al	J.H. Kurth Jr # 2	7730	8190	8250	0
11	128	The Texas Co.	Newton County Lbr. Co. Perrough unit 1	7990	8680	9450	0
12	130	Justiss- Mears oil Co. Inc:	Luther 8 Moore Lbr. Co. 1	3360	3620	4130	100
13	6	H.D. Cook Suici et al.	Texas A & M. 1	7000	7725	8450	0
14	208	L.D. Coin	Kirby Drenman 1	6700	7165	7750	35
		POLK COUNTY					
1	18	Mayo et al	Texas Long Leaf Lbr. Co.- 1	4200	4580	5140	55
2	99	Humble oil & Refg. Co.	Wittfoth 2	5450	5920	6460	25
3	62	Woodley Petr. Co.	J.H. Edmonds 1	5225	5720	6250	10
4	65	Sinclair Prairie	Jones - 1	5555	6070	6630	0
5	199	Texas Coastal oil Co.	Legger 1	4870	5300	5840	50
6	202	Cont . oil Co.	Carter B-1	5700	6060	- --	0
7	194	Albert Plummer	Pierce 1	3730	4070	4640	80
8	33	Lighfoot et al	Davidson 1	1600	1965	2440	170
9	56	J.Z. Werby	Saner- Ragley	2490	2850	3360	160
10	61	Jack Frazier	Beroman 2	5455	5925	6505	0
11	122	Jordan Drlg. Co.	Lynch Davison 1	2370	2715	3210	160
12	128	Wilbur Thomas	Dancy 1	3330	3720	4235	100
13	129	C.E. Gates	Jackson 1	3620	4030	4450	60
14	191	Producers inv.Corp & Webb & Knapp	Saner Ragler Lbr. Co. 1-A	2470	2900	3285	155
15	9	Pan Am. Prod. Co.	Texas Long Leaf B-4	5390	5860	6400	10
16	29	T,M. Rinehart	W.T. Carter & Bro. # 1	2150	2580	3110	225
17	101	Gem Oil Co.	Honaker-Carrier 1	5420	5910	6450	25
18	123	Jordan drlg. Co.	Kirby Lumber Co, 1	5830	6260	6870	25

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
		POLK COUNTY					
19	179	Oil Reserves Corp	W.T. Carter Bros C-1	6085	6645	7240	0
20	157	Kountze Mud Serv.	T.D. Stanford 1	3740	4260	4675	80
21	171	Kountze Mud Serv.	Champion Paper & Fiber 2	3500	3920	4400	75
22	193	Rio Rico oil Co.	Cameron # 1	2260	2620	3075	135
23	182	Standard oil Co. of Texas	A.L. Luthe # 1	4425	4670	5130	75
24	187	American Liberty oil Co. & Webb & Knapp	Cameron Meirs 1	2370	2770	3170	160
25	133	Humble oil & Refg. Co.	Carter C-1	6430	7050	7700	0
		ROBERTSON COUNTY					
1	42	The Layne Texas Co. LTD.	City of bryan test hole # 1	- -	(100)	344	160+
		SABINE COUNTY					
1	8	Coline Oil Corp.	Temple Lbr. Co. 1	1020	1200	1600	130
2	24	Delta Drlg. Co. & Pineland Co.	Ridge estate 1	1150	1340	1770	125
3	3	K.E. Merren	Stark & Brown # 1	2120	2400	2850	150
4	41	J.R. & J.P. Goldsmith	Southern Rine Lumber Co.# 1	350	560	900	150
5	10	Topaz Oil Co.	Garland P. Weeks 1	985	1220	1620	140
6	59	Bronson Mater Works Co.	Bronson Water - -- Supply Co . 1	425	640	1000	200
7	50	Sebastian & Smith	Warner Stave Co. 1	250	510	810	150
8.	40	Fairway Oil & Gas,- Inc.	Southern Pine Lumber Co. 1	- -	1210	1530	130
9	42	Castal Rep. Inc.	Temple Lbr. Co. 1	830	1070	1450	145
		SAN AUGUSTINE COUNTY					
1	4	Continental Oil Co.	Long Bell Lumber Co.2	- -	- -	670	80+
2	9	Carter Jones Drlg. Co.	Long Bell Pet. Co. # 1	- -	(500)	655	85
3	16	Combro Oil Co.	Anderson # 1	580	770	1180	165
4	3	Lester &Culberston	Childers 1	770	950	1380	160
5	1	Paper & Todd	Long Bell 2	1595	1880	2285	80
6	14	H.L. Poole	Joe Wade Longbell 1	- -	(530)	940	180+
7	25	A.A.Spidle *et al*.	Pickering Lumber Co. 1	- -	750	1150	180
8	27	H.L. Poole	W.R. Cousin Jr. 1	- -	720	1130	150
9	13	H.L. Poole	Pickering Lumber Co. 1	- -	- -	910	150+

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
		SAN JACINTO COUNTY					
1	57	J.W. Ohiphent	Gibbs 1	3035	3450	3925	160
2	56	Thomas concrete Pipe Co.	Haler & Manning Lbr. 1	3400	3800	4310	80
3	6	Humble oil & Refg. Co.	Gibbs 1	3380	3790	4300	120
4	32	Oil & Refg. Co.	Ben Oyle Tree 1	3720	4150	4620	120
5	122	Stanolind oil & Gas Co.	Carey Land dev. Co. 1	4550	5070	5560	60
6	132	Stanolind oil & Gas Co.	" " B-1	4140	4565	5100	90
7	55	Humble oil & Refg. Co.	Foster Lbr. Co.1	4810	5260	5790	30
8	107	Butcher-Arthur Inc	John D. Jones 1	5750	6250	6800	0
9	69	W.B. Frankel	F. Hogue 1	6030	- - -	- -	0
10	90	McDannald Oil Co.	Foster 1	5830	6270	6850	0
11	54	Texas Co.	Foster Lumber Co. # 1	5680	6150	6700	0
12	15	Jack Frazier	A.J. Smith 1	5610	6105	6585	0
13	140	Stanolind oil & Gas Co.	Langham 1	5625	6130	6700	0
14	53	Woodley Petr. Co. & Kirby Petr. Co., Jordan Drlg. Co.	Cummings 1	5630	- -	6700	0
15	4	San Jaci nto Co.	A. Plummer & Stegasters 1	6290	- -	- -	0
16	38	Continental oil Co. & Corletoon D. Speed DR.	Frost Lbr. Co. 1	6420	6970	7540	0
17	68	Mac Drlg. Co.	Payne 1	5850	6400	6950	0
18	63	Sun Oil Co.	Gibbs Bros-1	5670	6225	6770	0
		STARR COUNTY					
1	75	Glen Harroun	Guerra # 1	2500	2200	3000	30
2	886	Humble oil & Refg. Co.	Margo 1	3240	3410	4110	0
3	1015	H.H. Bowell	Margo 1	2850	3050	3680	0
4	145	T.E. Stephens	Gonzales Hirs 1	2840	3000	3700	0
		TRINITY COUNTY					
1	5	Gejer-Jackson Inc.	Houston Co, Timber Co. 2	- -	580	925	185
2	6	Magnolia Petr. Co.	Oscar Gibbson 1	- -	780	1115	195
3	8	American Liberty Oil Co.	Due 1	935	1050	1440	190
4	12	P.R. Ruther ford	Lawson 1	1370	1470	1880	175
5	22	Magnolia Petr. Co.	Bolton 2	1810	2150	2600	170
6	15	Pawley Petr, Incorporated & Mc Culloch Oil Corp.	Cameron Heirs 4	2225	2385	2770	150

Well No.	Q	Company	Well Name	Bv	Ti	Bi	Sd
7	4	Grossage & Davis	J.B. Gibbson 1	1710	1850	2280	155
8	10	C.O. Bond et al Bunn Texas Drig.Co.	Texas Long Leaf 1	2330	2775	3190	150
9	13	Pan Am. Prod.	Texas Long Leaf Lbr. Co. 1	1340	1525	1900	185
10	27	J.G. Roberts	Bain 1	2025	2215	2600	195
11	35	Bradley Prod. Corp.	Crouch-dilley Unit 1	1230	1450	1820	190
12	39	Palm. Petr. Co.	Cameron 5	1580	1670	2100	160
13	40	Palm Petr. Corp.	Cameron 4	1560	1940	2370	160
14	38	Palm Petr. Co.	Cameron 3	1920	2050	2480	180
15	2	Watburn Oil Co.	E.C. Bolton	1890	2060	2430	190
16	41	Humble Oil & Refg.Co.	J.M. Moore 1	1260	1425	1770	150

TYLER COUNTY

Well No.	Q	Company	Well Name	Bv	Ti	Bi	Sd
1	17	General Crude Oil Co.	Mattie wilson 1	2588	2950	3420	105
2	25	Francklin Tideman	Thomas-Schliche 1	3270	3655	4130	110
3	23	Humble oil & Refg. Co.	Denman-Kuntze 2-B	3020	3340	3860	170
4	19	General Crude oil Co.	Mattaver 1	2355	2660	3130	110
5	39	Justiss-Mears oil Co.	Wot Carter & Brother D-1	3820	4065	4560	110
6	36	Justiss-Mears oil Co.	W.t. Carter & Brother A-1	4410	4820	5380	90
7	37	Justiss-Mears oil Co.	W.T. Carter & Brother B-1	4620	5050	5600	80
8	24	Louis Franklin	Hayes 1	3180	3530	4020	110
9	170	Atlantic-Richfield Co. Sinclair oil & Gas Co.	Humble Fee # 1	3420	3760	4240	165
10	103	John B. GoodHue	A.N. Owens 1	3300	3630	(4000)	100
11	18	J.C. Bonham	Sw. Lbr.Co.	2840	3180	3650	110
12	122	Nero oil Co. Inc.	Ethyl sawyer 1	5700	6200	6150	0
13	31	North Central Oil Co. et al.	F.H. Duunagel 1	6130	6540	7130	5
14	66	Humble oil & Refg.Co.	Goolsbee B-1	5970	6430	7000	0
15	70	Atlantic Refg. Co.	Rice # 1	6090	6470	7040	5
16	51	Grubb & Hawkins	Kirby Lumber Co. 1	5515	6350	6730	0
17	101	Amerada Petr. Corp	Charles G. Hooks 1	6320	6870	7320	0
18	128	American Republics Corp.	Rosford et al. 1	6380	6740	7050	0
19	35	Am . Rep. Corp.	Wiess # 1	6575	6870	7400	0
20	50	Republic-Houston	Hurd # 28	6100	6700	7330	0
21	106	Stanolind oil & Gas Co.	J.F. Parker 5	6515	7110	7830	0
22	141	Pan American Petr. Corp.	Long Bell 1	4350	4690	5275	115
23	74	Dishman $ Lucas	Angelina Lumber Co.1	4590	4900	5450	80
24	135	Kent Exploration Co.	R.L. Pope No. 1	5840	6200	6750	0

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
			WALKER COUNTY				
1	12	Albert Plummer	Gibbs 1	1310	1540	1960	150
2	24	Field M. Davis & Rodney de Lange	Gibbs Bros 1	1230	1490	1900	170
3	10	Standard oil Co.	Doyle F. MCADAMS et al 1	1650	1880	2310	215
4	3	Magnolia Petr. Co.	Thompson Long Leaf Lbr. Co. A-1	1550	1680	2150	260
5	39	H.L. Hawkins & H.L. Hawkins Jr et al	Earl Morris 1	1865	2010	2480	215
6	13	Mike Hogg et al	Gibbs bros. & G.A. Wynne est. 1	2000	2225	2700	230
7	17	Mike Hogg et al	Lucy C. Smith of et al 1.	2120	2220	2720	240
8	23	Union Prod.Co.	Smither 1	2085	2805	3205	230
9	22	Tidewater oil Co.	A.D. Newman Unit 1	2700	2840	3280	160
10	30	Moram oil Co.	Oliphint 1	3870	4230	4630	125
11	4	Mora Oil Co. & Garflo oil Co.	Foster Estate 1	4265	4830	5250	115
12	1	Hinckle Drlg.Co. & R.H. Abercrombin	J.S. Angler 1	4050	4505	5025	115
13	15	J.W. Wren	Gibbs Bros	3540	3950	4350	155
14	16	Ore & Jackson	Bishop 1	1870	1970	2470	185
15	21	Gem oil Co.	A J. Belle et al. 1	2360	2835	3240	165
16	32	Mora oil Co.	Oliphint 1	3870	4230	4630	125
17	51	Petro Nuclear Inc.	Gibbs Bros & Co. 1	2970	3215	3740	175
18	52	Woodley Petr Co. & Stanolind Oil & Gas Co.	Heath 1	1925	2330	2790	125
19	59	Robinson oil & Gas Co.	Smithers 1	2420	2610	3140	230
20	56	Dahn Harri n Jr.	Gibbs Bros 1	2350	2750	3250	175
21	50	M.H. Marr & The Muran Corp.	Katie Word 1	3260	4200	4700	120
22	5	W.E. Allaun	Central coal & Coke 1	4760	5160	5690	75
23	20	H.C. Bishop	D.R. Hardy 1	5060	5540	6100	20
			WALLER COUNTY				
1	96	Geo.W.Strake	Humphreys 1	5950	6500	7020	0
2	93	Pam Am. Prod. Co.	Humphreys 1	5950	6500	7000	0
3	16	The Texas Co.	Rice Institutel	6015	6650	7200	0
4	91	Sun Oil Co.	Von Blucher 1	5770	6300	6839	10
5	17	Skelly Oil Co.	Roy Chapman 1	5210	5720	6220	45
6	94	The Texas Co.	Walter O --- Coldwell 2	5200	5750	6250	50

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
7	85	Floyd L. Karters	J.J. Menke 1	5490	6130	6680	45
8	119	Humble Oil & Refg. Co.	Rufus Hardy B-14	5200	5750	6250	5
9	130	Sinclair oil & - - Gas Co.	Mc. Dade 1	6130	6550	7030	15
10	92	H.L. Hunt	C.H. Henke 1	6520	7300	7850	0

WASHINGTON COUNTY

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
1	37	R. J. Whelan	Salomon 1	1875	2060	2375	165
2	15	Travis oil Co.	Fred. W. Dallas 3	3170	3480	4030	230
3	24	Humble oil Refg. Co.	Lauter 1	2360	2720	3170	175
4	47	Western Natural Gas	Bohne 1	4565	5020	5580	95
5	46	Sinclair oil & Gas Co.	Benn Henry 1	4840	5280	5860	75
6	45	Union Sulphur Co.	Joe Kube cza 1	4910	5230	5800	20
7	2	Speed oil Co.	Ma kowsky 1	3160	3360	3700	160
8	38	Hurt oil Co.	E.W. pieper 1	4625	4940	5500	105
9	43	Rutledge & clark	Stzelke 1	4770	5100	5670	75
10	41	Magnolia Petr. Co.	Nettie Anderson 1	2160	2460	2980	175
11	23	Sun Ray	Lockhart 1	5100	5640	6220	80
12	27	The Texas Co.	A. Jeske 1	3290	3560	3960	170
13	29	Shell oil Co.	C.W. Jackson 1	3555	3845	4350	180
14	34	Phillips Petr. Co.	Priesmeyer 1	3090	3430	3900	95
15	36	Champlin Refg. Co.	Dallmeyer 1	2570	2665	3120	195
16	39	Marr & Witco	A. Lakmert 1	3895	4260	4750	130
17	58	John Mayo & Foretich et al	Parker 1	3930	4290	4830	145

WILSON COUNTY

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
1	2	M.L. Wise and O.W. Killam	Stanley Bench No. 1		110	300	120
2	206	Diamond Half Oil Corp.	Korzekwa No. 1	475	550	770	85
3	44	Humble Oil and Refining Co.	Edmon Lyssy No. 1	220	540	750	90
4	76	George H. Coates	T.C. Cobb No. 1	390	730	940	85
5	104	M.O. Turner	Mary Lyssy No. 1	600	900	1120	75
6	11	O.G. McClain	S.V. Houston	1050	1280	1480	85
7	55	Frank J. Gravis et al	J.H. McDaniel No. 1	370	730	920	100
8	100	Humble Oil and Refining Co.	N.A. Poth No. 1	920	1285	1500	100
9	193	Luling Oil and Gas -- Co.	Rutkowski No. 1	1050	1400	1615	85
10	218	H.H. Howel	Weinert No. 3-A	- -	425	590	80
11	252	E.T. Mowinkle	Richter No. 1	300	385	570	90
12	267	L.A. Douglas	H.H. Buch No. 1	280	380	590	100

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
			WEBB COUNTY				
1	76	Kirkwood and Morgan	A.E. Schletez No. 2	- -	- -	390	160+
2	622	Seaboard oil Co.	O. Benavides # 1	570	660	980	180
3	94	Robert Mosbacher	Webb County Commissioners Court No. 1	- -	100	340	160+
4	3	Seaboard Oil Co. and Sunray Oil Co.	Mary K. Withers No. 1	1690	2050	2340	145
5	133	Humble Oil and Refining Co.	Louis Yaeger No. B-1	2360	2910	3100	75
6	101	Sohio Production Co.	Gallaghan Land and Pastoral Co. No. A-1	1900	2070	2320	135
7	21	Sinclair-Prairie Callaghan Land.	Pastupal Co. No. 1	1800	1925	2200	155
8	196	Kirwood Drilling Co.	Olmitos Ranch No. 1	1840	2010	2240	140
9	212	Mrs. James R. Dougherty and F. W. Holbrook	W.R. Nicholson Est. No. 1	2280	2465	2760	135
10	241	Tucker Drilling Co. and Peter Henderson Oil Corporation	W.P. Lincoln No. 1	2000	2170	2420	145
11	40	Humble Oil Co. and-Refining	W.R. Nicholson No. 3	2450	2850	3100	90
12	123	Rodned Delange and O. Neathery, Jr.	Lallaghan Land and Pastoral Co. No.1	860	1140	1495	245
13	92	H.L. Hunt	John E. Carr No. 1	2300	2650	2960	140
14	265	The Atlantic Refin ing Co.	Billings No. 1-A	4210	850	280	0
15	20	Union Oil Co. of California	M. Volpe et al. No. A-2	630	870	1300	160
16	228	Richardson Petroleum Inc.	W.H. McKendrick No. 1	1775	1885	2325	225
17	43	Sun Oil Co.	Texas Calgary No. 1	2790	2940	490	100
18	269	J.S. Abecromble Minerals Co.	J.C. Martin 1	1500	1635	2065	205
19	264	The Atlantic Refining Co.	Bruniestate No. A-1	3800	4480	4850	5
20	752	Ginther Warren Co. Halbouty <u>et al</u>.	A. M. Bruni Est. No. 2	1080	1110	1470	240
21	760	W. M. Wisemin and White	Stewart # 1	--	150	530	150+
22	772	W. M. Null and Flonroy Production Co.	Matias de Llano # 1	1000	1230	1550	220
23	28	The Texas Co.	A.M. Bruni Estate No. 1-NCT-1	2760	2970	3430	190
24	30	Sinclair Oil and Gas Co.	Dix Ranch No. 1	1370	1490	1810	240
25	37	Allied Drlg. Co.	McKendrick # 1	700	850	1250	300
26	115	American Liberty Oil Co.	Kirkpatrick 1	3610	4220	4540	0

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
27	112	Sun Oil Co.	Isaac Hirsch No.2	1550	1670	1990	180
28	127	T.J. Ahern	Hubbard No. A-1	240	380	870	210
29	150	Brown and Wheeler	Maria Martin et al. No. 1	640	830	1220	275
30	192	Delhi-Taylor Oil Corp.	A.M. Bruni Est. No. B-1	4240	4870	5260	0
31	719	Carlon oil Co.	J. C. Martin No. 1-A	1750	1875	- -	200
32	209	Gulf Oil Corp.	Isaac Hirsch No. 1	1970	2100	2390	160
33	310	Southland Royalty Co.	J.C. de Uribe No. 1	4110	5000	5350	0
34	444	Union Producing Co. and Continental Oil Co.	O.W. Killan No. 1	2030	2170	2600	135
35	573	Sohio Petroleum Co.	Maria G. Martin # 1	3900	4700	4940	0
36	458	O.W. Killam	Ortiz Est. No.2	510	820	1260	210
37	613	Transwertern Oil and Seaboard Oil Co.	Callaghan Land and Pastoral Co. No. 1	1565	1745	2000	170
38	675	A.M. Amsler	A.M. Bruni No. 1	2030	2180	2630	160
39	684	Phillips Petroleum Co.	A. M. Bruni Est. No.1	1860	2010	2400	210
40	80	Killam and Hurd	Bruni-Leyendecke # 2	1900	2020	2450	180
41	706	Russel Maguire	Machar No. 2	- -	- -	625	75+
42	248	Ginther, Warren & Union Tex. Pet.	Rosa Vela de Benavides 1	1270	1300	1645	225
43	723	Gulf Oil Corp.	J.O. Walker No. 1	2220	2380	2650	140
44	146	Humble Oil Refg. Co.	W.R. Nicholson 1	2440	2820	3130	85
45	55	Goldston Oil Corp.	Marrs Mclean 1	2860	3470	3730	15
46	544	Earl Rowe & Glenn Mortimer, Jr.	A. Moss # 1-B	3110	3750	3960	10
47	734	Russell McGuire et al	Hachar No. A-1	- -	200	620	290
48	514	Tylor Refg. Co.	W.R. Hughes # 1	2420	2995	3270	75

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd

ZAPATA COUNTY

Well No.	Q	Company	Well Name	By	Ti	Bi	Sd
1	7	Pontiac Refining Corp.	Somerset Land and Cattla Co. No. A-1	- -	1300	1750	255
2	227	W B. Jayred	J.M. Gutierrez No. 1	- -	1410	1980	115
3	71	Jake L. Hamon	Manvela Izaguirre No. 1	870	1535	2120	80
4	11	Stanolindoil and Gas Co.	Serapio Vela No. 1	650	1520	2150	120
5	38	American Republics Corp., H.R. Smith & Henderson Coquat	Loenard Haynes Est. No. 1	1910	2250	2760	180
6	40	Fullerton Oil Co.	Carlos Vela No. 1	880+	1440	2050	110
7	41	Solo Oil Co.	Terrel Bartlett No. 1	1880	2250	2800	160
8	44	Miller and Pierce	Maurice Alexander No. 1	- --	580	1150	220
9	45	Solo Oil Co.	I.M. Singer No. 1	570	1150	1750	150
10	52	Breuer and Curran	Martin No. 1	1440	1600	2030	230
11	82	E. Cockrell, Jr. et al.	Gopher Trust No. 1	1860	2000	2465	210
12	88	S.A. Story and Asso cciates	Knox-Williams No. 1	1730	1900	2340	150
13	91	Long Brothers et al.	Cesareo P. Flores No. 1	2760	2940	3430	110
14	100	American Republic Corp. & H. R. Smith	Uribe No. 1	2250	2400	2880	90
15	178	Dr. George Estes	Juan Martinez No. 1	705	850	1280	260
16	239	Humble oil and Refining Co.	Paula V. de Garza No. 1	4160	5010	5600	5
17	254	Humble Oil and Refining Co.	J. Y. McDermott No. 1	1780	1900	2500	55
18	280	Dake H. Rowden	F. Cuellar # B-1	3710	4120	- -	20+
19	284	Lone Star Prod. Co.	San Juan Vela # 1	2270	2450	3000	60
20	312	Sun Oil Co.	Humberto Vela No. 1	1200	1850	2470	120
21	236	George Schools	T.Dominguez # 1	710	1300	1880	130

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